

**Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

**Data Requirement:** PMRA Data Code: 8.3.2.1, 8.3.2.2  
EPA DP Barcode: 349858  
OECD Data Point: IIIA 9.2.1  
EPA Guideline: 835.6100

**Test material:** Saflufenacil

**End Use Product name:** BAS 800 UC H  
**Formulation type:** Emulsifiable concentrate

**Concentration of a.i.:** 120 g ai/L

Test material:

Common name: Saflufenacil.

Chemical name:

IUPAC name: N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.  
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

CAS name: 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

CAS No.: 372137-35-4.

Synonyms BAS 800 H, CL No. 433379, 4054449, AC 433,379.

Smiles string: N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).

**EPA Reviewer:** Greg Orrick  
USEPA

**Signature:** *Greg Orrick*  
**Date:** *June 8, 2009*

**PMRA Reviewer:** Janine Glaser (1009)  
HC-PMRA-EAD

**Signature:** *[Signature]*  
**Date:** 2008 November 28

**APVMA Reviewer:** Daryl Murphy  
DEWHA/APVMA

**Signature:** *D. Murphy*  
**Date:**

**Company Code:** BAZ

**Active Code:** SFF

**Use Site Category:** 13 and 14

**EPA PC Code:** 118203



2083839

Chemical name Saflufenacil  
PC code 118203  
MRID 47128235  
Guideline No. 835.6100

Maximum interval between irrigation.

| Site 1:   | Site 2:   | Site 3:   |
|-----------|-----------|-----------|
| 21-Aug-06 | 15-Sep-06 | 20-Jul-06 |
| 9-Oct-06  | 4-Oct-06  | 8-Aug-06  |
| 49        | 19        | 19        |

Data obtained from Appendix F, Tables A1-1-A1-3, pp. 505-519 of the study report.

# Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Submission Number {.....}

EPA MRID Number 47128235

**Data Requirement:** PMRA Data Code: DACO 9.3.2.1, 8.3.2.2, 8.3.2.3  
EPA DP Barcode: D349858  
OECD Data Point: IIA 7.3.1, IIIA 9.2.1  
EPA Guideline: 835.6100  
OPPTS Guideline: 835.6100

**Test material:** Saflufenacil

**End Use Product name:** BAS 800 UC H  
**Formulation type:** Emulsifiable concentrate

**Concentration of a.i.:** 120 g ai/L

Test material:

Common name: Saflufenacil.

Chemical name:

IUPAC name: N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.  
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.


CAS name: 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

CAS No.: 372137-35-4.

Synonyms BAS 800 H, CL No. 433379, 4054449, AC 433,379.

Smiles string: N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).


**Primary Reviewer:** Amy Barnes  
**Cambridge Environmental**

**Signature:**   
**Date:** 5/29/08

**Secondary Reviewer:** Joan Harlin  
**Cambridge Environmental**

**Signature:**   
**Date:** 5/29/08

**QC/QA Manager:** Joan Gaidos  
**Cambridge Environmental**

**Signature:**   
**Date:** 5/29/08

**Final Reviewer:** Greg Orrick  
**EPA Reviewer**

**Signature:**  
**Date:**

**Company Code**  
**Active Code**  
**Use Site Category**  
**EPA PC Code:** 118203

Chemical name Saflufenacil  
PC code 118203  
MRID 47128235  
Guideline No. 835.6100

Calculation for the maximum concentration of transformation products as percent of the total applied saflufenacil:

0-7.5 cm depth

|  |      |                         |
|--|------|-------------------------|
| Maximum concentration of M800H08 at Site 1 (ppm) = | 0.02 | at 15, 30-90 days       |
| Maximum concentration of M800H08 at Site 2 (ppm) = | 0.03 | at 30 days              |
| Maximum concentration of M800H08 at Site 3 (ppm) = | 0.02 | at 4-6, 20, and 45 days |

From Appendix B, Tables B1-B3, pp. 58, 65, 72 and Appendix D, Tables VIII-X, pp. 136, 143, 150 of the study report.

|  |       |
|--|-------|
| Molecular weight of saflufenacil (g/mol) = | 500.9 |
| Molecular weight of M800H08 (g/mol) =      | 502.9 |
| Molecular weight conversion factor =       | 1.00  |

|  |       |
|--|-------|
| Maximum concentration of M800H08 as percent of the total applied saflufenacil, Site 1 =            | 12.5% |
| Maximum concentration of M800H08 as percent of the initial concentration of saflufenacil, Site 1 = | 12.5% |
| Maximum concentration of M800H08 as percent of the total applied saflufenacil, Site 2 =            | 22.8% |
| Maximum concentration of M800H08 as percent of the initial concentration of saflufenacil, Site 2 = | 21.3% |
| Maximum concentration of M800H08 as percent of the total applied saflufenacil, Site 3 =            | 10.6% |
| Maximum concentration of M800H08 as percent of the initial concentration of saflufenacil, Site 3 = | 22.1% |

|  |      |            |
|--|------|------------|
| Maximum concentration of M800H07 at Site 3 (ppm) = | 0.01 | at 45 days |
|--|------|------------|

From Appendix B, Table B3, p. 71 and Appendix D, Table X, p. 149 of the study report.

|  |       |
|--|-------|
| Molecular weight of saflufenacil (g/mol) = | 500.9 |
| Molecular weight of M800H07 (g/mol) =      | 380.8 |
| Molecular weight conversion factor =       | 0.76  |

|  |       |
|--|-------|
| Maximum concentration of M800H07 as percent of the total applied saflufenacil, Site 3 =            | 7.0%  |
| Maximum concentration of M800H07 as percent of the initial concentration of saflufenacil, Site 3 = | 14.6% |

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

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**CITATION:** Jordan, J., M.G. Saha, and R. Warren. 2008. Terrestrial field dissipation of BAS 800 H in row crop use patterns. Unpublished study performed by BASF Agro Research, Research Triangle Park, North Carolina, Mid-South Ag Research, Proctor, Arkansas (field phase), Alvey Agricultural Research, Carlyle, Illinois (field phase), ICMS, Inc., Portage la Prairie, Canada (field phase), and Agvise Laboratories, Inc., Northwood, North Dakota (soil characterization), and sponsored and submitted by BASF Agro Research, Research Triangle Park, North Carolina. BASF Study No.: 132668. BASF Registration Document Number: 2007/7009867. Experiment initiation May 2, 2006, and completion December 3, 2007 (p. 9). Final report issued January 8, 2008.

### EXECUTIVE SUMMARY

Soil dissipation/accumulation of saflufenacil (BAS 800 H; N'-{2-chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide) under U.S. and Canadian field conditions were studied using a bare plot of silt loam soil at one site in Arkansas (Ecoregion 8.5.2), a bare plot of silt loam soil at one site in Illinois (Ecoregion 8.3.2), and a bare plot of loam soil at one site in Manitoba (Ecoregion 9.2.2). The experiment was carried out in accordance with the USEPA Pesticide Assessment Guideline Subdivision N 164-1, and in compliance with the USEPA FIFRA (40 CFR, Part 160) GLP standard. Saflufenacil was broadcast once at a target application rate of 0.15 kg a.i./ha (0.134 lb a.i./A) to bare plots that were *ca.* 7 x 46 m, 3 x 23 m, and 6 x 32 m in size, for Sites 1, 2, and 3 respectively, and each divided into three replicate plots. The test application was made at the proposed label rate for field and row crops. Total water input (precipitation plus irrigation) during the study period was approximately 55.2 inches or 96.7% of the historical average for Site 1, 62.9 inches or 108.4% of the historical average for Site 2, and 22.37 inches or 100.2% of the historical average for Site 3. A control plot (bare ground) was located *ca.* 15 m from the nearest treated plot at each test site.

The application rate was verified at each test site using ten Speedisk™'s placed randomly in each of the three replicate plots (30 total), with mean recovery of saflufenacil averaging 90%, 101%, and 86% of the theoretical, based on the target application rate at Sites 1, 2, and 3, respectively. Field spikes were prepared by fortifying untreated soil samples with saflufenacil at 2.5 µg/g at various sampling intervals, which were then transported and stored under the same conditions as the test samples. The overall mean recovery of saflufenacil from field spikes ranged from 67-101%, 78-102%, and 68-106% for Sites 1, 2, and 3, respectively. Field spikes were stored for up to 518 days (Site 1), 482 days (Site 2) or 509 days (Site 3) prior to analysis.

Soil samples were collected from each site at approximately -1, 0, 1, 2, 4, 6, 8, 10, 15, 20, 30, 45, 60, 75, 90, 120, 150, 180, 270, and 360 days following the test application, to a depth of 0-120 cm. Soil samples were extracted by shaking with acetonitrile followed by acetonitrile:water (40:60, v:v). The extracts were diluted and analyzed for saflufenacil and the transformation products M800H01 (N-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N'-isopropylsulfamide), M800H02 (N'-[2-chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydropyrimidin-1(2H)-yl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide), M800H07 (N-{4-chloro-2-fluoro-5 [(isopropyl(methyl)amino)sulfonyl]amino}carbonylphenyl}-N'-methylurea), M800H08 (N'-[2-chloro-4-fluoro-5-(3-methyl-

Chemical name Saflufenacil  
PC code 118203  
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Guideline No. 835.6100

Calculation for saflufenacil as the percent of the day 0 theoretical:

Site 1 (0-7.5cm)

| Saflufenacil        |                              |
|---------------------|------------------------------|
| Concentration (ppm) | Percent of day 0 theoretical |
| day 0               | day 0                        |
| 0.16                | 100.7%                       |

From Appendix B, Table B1, p. 54 and Appendix D, Table VIII, p. 132 of the study report.

Site 2 (0-7.5cm)

| Saflufenacil        |                              |
|---------------------|------------------------------|
| Concentration (ppm) | Percent of day 0 theoretical |
| day 0               | day 0                        |
| 0.14                | 107.0%                       |

From Appendix B, Table B2, p. 61 and Appendix D, Table IX, p. 139 of the study report.

Site 3 (0-7.5cm)

| Saflufenacil        |       |                              |       |
|---------------------|-------|------------------------------|-------|
| Concentration (ppm) |       | Percent of day 0 theoretical |       |
| day 0               | day 1 | day 0                        | day 1 |
| 0.09                | 0.14  | 48.1%                        | 74.8% |

From Appendix B, Table B3, p. 68 and Appendix D, Table X, p. 146 of the study report.

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

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2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinylbenzoyl]-N-isopropyl-n-methylsulfamide), M800H22 (3-[(4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]-amino)carbonyl]anilino)carbonyl(methyl)amino]-4,4,4-trifluorobutanoic acid) and M800H15 (N-{4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino}carbonyl]phenyl}-4,4,4-trifluoro-3,3-dihydroxybutanamide) using LC/MS/MS operated in the positive ion mode. The LOQ was 0.01 mg/kg and the LOD was 0.002 mg/kg for all analytes. Soil samples were stored for up to 518 days (Site 1), 526 days (Site 2) or 553 days (Site 3) prior to analysis.

Following application at Site 1 (Arkansas), the mean measured zero-time concentration of saflufenacil in the 0-7.5 cm soil depth was 0.16 ppm or 100.7% of the theoretical (the percent recovery was reviewer-calculated based on a theoretical day 0 recovery of 0.159 ppm for the 0-7.5 cm soil depth). Saflufenacil decreased to 0.11 ppm at 1 day, 0.05 to 0.06 ppm at 10 to 20 days, 0.03 ppm at 30 days, and was last detected above the LOQ at 0.01 ppm (two replicate detections) at 60 days posttreatment. Saflufenacil was detected in the 7.5-15 cm soil depth at a maximum mean of 0.02 ppm at 2 days posttreatment, decreased to 0.01 ppm (single replicate detections) at 6 and 8 days posttreatment, and was not detected above the LOQ in soil below the 7.5-15 cm depth.

The transformation product **M800H08** was detected in the 0-7.5 cm soil depth at a maximum mean concentration of 0.02 ppm (which is equal to 12.5% of both the theoretically applied and the initial soil concentration of saflufenacil) at 15 days and 30 to 90 days, decreased to 0.01 ppm at 150 to 180 days, and was not detected above the LOQ in soil below the 0-7.5 cm depth.

Following application at Site 2 (Illinois), the mean measured zero-time concentration of saflufenacil in the 0-7.5 cm soil depth was 0.14 ppm or 107.0% of the theoretical (the percent recovery was reviewer-calculated based on a theoretical day 0 recovery of 0.131 ppm for the 0-7.5 cm soil depth). Saflufenacil decreased to 0.07 ppm at 10 days, 0.03 ppm at 20 days, and was last detected above the LOQ at 0.01 ppm (single replicate detection) at 45 days posttreatment. Saflufenacil was not detected above the LOQ in soil below the 0-7.5 cm depth.

The transformation product **M800H08** was detected in the 0-7.5 cm soil depth at a maximum mean concentration of 0.03 ppm (which is equal to 22.8% of the theoretically applied and 21.3% of the initial soil concentration of saflufenacil) at 30 days, decreased to 0.02 ppm at 45 to 60 days and 90 days, and was last detected above the LOQ at 0.01 ppm (single replicate detection) at 120 days posttreatment. M800H08 was detected twice in the 7.5-15 cm soil depth at 0.01 ppm (single replicate detections) at 45 to 60 days, and was not detected above the LOQ in soil below the 7.5-15 cm depth.

Following application at Site 3 (Manitoba), the mean measured zero-time concentration of saflufenacil in the 0-7.5 cm soil depth was 0.09 ppm or 48.1% of the theoretical (the percent recovery was reviewer-calculated based on a theoretical day 0 recovery of 0.187 ppm for the 0-7.5 cm soil depth), and increased to a maximum of 0.14 ppm (74.8% of the theoretical) at 1 day posttreatment. Saflufenacil decreased to 0.07 ppm at 30 days, 0.03 ppm at 60 days, and was last detected above the LOQ at 0.01 ppm (two replicate detections) at 90 days posttreatment. Saflufenacil was initially detected in the 7.5-15 cm soil depth at 0.01 ppm (two replicate detections) at 1 day posttreatment, increased to a maximum mean of 0.03 ppm at 4 days, and ranged from 0.01

Chemical name Saflufenacil  
 PC code 118203  
 MRID 47128235  
 Guideline No. 835.6100

Spreadsheet to convert application rate from lbs a.i./Acre to to mg a.i./kg (ppm)

Site 1 (Arkansas)

|   |   |                        |
|---|---|------------------------|
| See study for values to input           | Application rate:                                     | 0.134 lbs a.i./Ac      |
|   | Depth of plow layer:                                  | 7.5 cm                 |
|   | Bulk density for specified plow layer reported above: | 1.26 g/cm <sup>3</sup> |
| Automatically calculated by spreadsheet | Application rate converted to mg/kg:                  | 0.159 mg a.i./Kg (ppm) |
|   | Application rate converted to kg a.i./ha              | 0.15 kg a.i./ha        |

Site 2 (Illinois)

|   |   |                        |
|---|---|------------------------|
| See study for values to input           | Application rate:                                     | 0.134 lbs a.i./Ac      |
|   | Depth of plow layer:                                  | 7.5 cm                 |
|   | Bulk density for specified plow layer reported above: | 1.53 g/cm <sup>3</sup> |
| Automatically calculated by spreadsheet | Application rate converted to mg/kg:                  | 0.131 mg a.i./Kg (ppm) |
|   | Application rate converted to kg a.i./ha              | 0.15 kg a.i./ha        |

Site 3 (Manitoba)

|   |   |                        |
|---|---|------------------------|
| See study for values to input           | Application rate:                                     | 0.134 lbs a.i./Ac      |
|   | Depth of plow layer:                                  | 7.5 cm                 |
|   | Bulk density for specified plow layer reported above: | 1.07 g/cm <sup>3</sup> |
| Automatically calculated by spreadsheet | Application rate converted to mg/kg:                  | 0.187 mg a.i./Kg (ppm) |
|   | Application rate converted to kg a.i./ha              | 0.15 kg a.i./ha        |



## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

to 0.02 ppm from 6 to 20 days posttreatment. Saflufenacil was detected once in the 15-30 cm soil depth at 0.02 ppm (single replicate detection) at 6 days posttreatment, and was not detected above the LOQ in soil below the 15-30 cm depth.

The transformation product **M800H08** was detected in the 0-7.5 cm soil depth at a maximum mean concentration of 0.02 ppm (which is equal to 10.6% of the theoretically applied and 22.1% of the initial soil concentration of saflufenacil) at 4 to 6 days, 20 days, and 45 days, and decreased to 0.01 ppm (single replicate detection) at 60 days. M800H08 was not detected above the LOQ in soil below the 0-7.5 cm depth. The transformation product **M800H07** was detected once in the 0-7.5 cm soil depth at a concentration of 0.01 ppm (two replicate detections; which is equal to 7.0% of the theoretically applied and 14.6% of the initial soil concentration of saflufenacil) at 45 days posttreatment, and was not detected above the LOQ in soil below the 0-7.5 cm depth.

Under field conditions at Site 1 (Arkansas), saflufenacil dissipated from the top 7.5 cm of soil with a half-life of 17.1 days ( $r^2 = 0.850$ ); calculated using linear regression on replicate data following the maximum mean detection (*i.e.*, 0- to 60-day data) and assuming that concentrations less than the LOQ were one-half the LOQ (*i.e.*, 0.005 ppm). Respective DT75 and DT90 values were 34.2 days and 56.8 days. Saflufenacil and its transformation products were not available for carryover at the end of the study period; residues were not detected above the LOQ after 180 days posttreatment.

Under field conditions at Site 2 (Illinois), saflufenacil dissipated from the top 7.5 cm of soil with a half-life of 10.4 days ( $r^2 = 0.917$ ), calculated using linear regression on replicate data following the maximum mean detection (*i.e.*, 0- to 45-day data) and assuming that concentrations less than the LOQ were one-half the LOQ (*i.e.*, 0.005 ppm). Respective DT75 and DT90 values in soil were 20.9 days and 34.6 days. Saflufenacil and its transformation products were not available for carryover at the end of the study period; residues were not detected above the LOQ after 120 days posttreatment.

Under field conditions at Site 3 (Manitoba), saflufenacil dissipated from the top 7.5 cm of soil with a half-life of 24.6 days ( $r^2 = 0.563$ ); calculated using linear regression on replicate data following the maximum mean detection (*i.e.*, 1- to 90-day data) and assuming that concentrations less than the LOQ were one-half the LOQ (*i.e.*, 0.005 ppm). Respective DT75 and DT90 values were 49.2 days and 81.6 days. Saflufenacil and its transformation products were not available for carryover at the end of the study period; residues were not detected above the LOQ after 90 days posttreatment.

The major routes of dissipation of saflufenacil under terrestrial field conditions at each of the test sites included transformation and leaching.

Chemical name Saflufenacil  
 PC code 118203  
 MRID 47128235  
 Guideline No. 835.6100

Site 3 (Manitoba)  
 0-7.5 cm depth

C0 0.11781403  
 k 0.01761317  
 t 1/2 39.3539055  
 SSE 0.04035083  
 R^2 0.48878065

#### ANOVA

| Source | Df | SS          | MS        | F         | p          |
|--------|----|-------------|-----------|-----------|------------|
| Reg    | 1  | 0.038579729 | 0.0385797 | 32.507655 | 2.1034E-06 |
| Error  | 34 | 0.040350827 | 0.0011868 |           |            |
| Total  | 35 | 0.078930556 |           |           |            |

#### SUMMARY OUTPUT

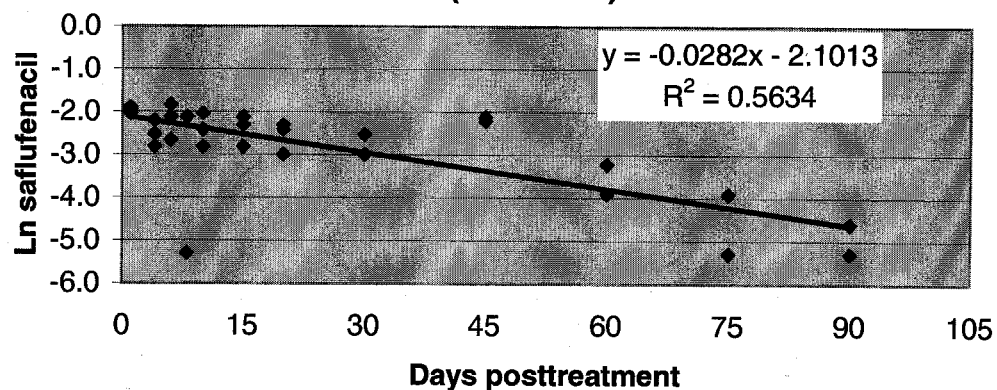
| Regression Statistics |            |
|-----------------------|------------|
| Multiple R            | 0.75062196 |
| R Square              | 0.56343332 |
| Adjusted R Square     | 0.55059312 |
| Standard Error        | 0.73935579 |
| Observations          | 36         |

#### ANOVA

|            | df | SS          | MS        |
|------------|----|-------------|-----------|
| Regression | 1  | 23.98710377 | 23.987104 |
| Residual   | 34 | 18.58599735 | 0.546647  |
| Total      | 35 | 42.57310112 |           |

|              | Coefficients | Standard Error | t Stat    |
|--------------|--------------|----------------|-----------|
| Intercept    | -2.1013045   | 0.178510462    | -11.77132 |
| X Variable 1 | -0.0282053   | 0.0042579      | -6.62423  |

**Dissipation of saflufenacil from top 7.5 cm of  
 Site 3 (Manitoba) soil**



## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

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### RESULTS SYNOPSIS

#### Site 1

Location/soil type: Proctor, Crittenden County, Arkansas/Silt loam (0-30 cm).

Upper 7.5 cm of soil (reviewer-calculated; SFO kinetics model):

DT50: 17.1 days ( $r^2 = 0.850$ )

DT75: 34.2 days

DT90: 56.8 days

Whole soil profile (study values confirmed by PMRA reviewer; DFOP kinetics model):

DT50: 6.25 days ( $r^2 = 0.902$ ).

DT75: 24.4 days.

DT90: 50.4 days.

Transformation products detected: M800H08.

Dissipation routes: Transformation and leaching.

#### Site 2

Location/soil type: Carlyle, Clinton County, Illinois/Silt loam (0-30 cm).

Upper 7.5 cm of soil (reviewer-calculated; SFO kinetics model):

DT50: 10.4 days ( $r^2 = 0.917$ )

DT75: 20.9 days

DT90: 34.6 days

Whole soil profile (study values confirmed by PMRA reviewer; SFO kinetics model):

DT50: 11.1 days ( $r^2 = 0.923$ ).

DT75: 22.1 days.

DT90: 36.7 days.

Transformation products detected: M800H08.

Dissipation routes: Transformation and leaching.

#### Site 3

Location/soil type: Portage la Prairie, Manitoba, Canada/Loam (0-15 cm).

Upper 7.5 cm of soil (reviewer-calculated; SFO kinetics model):

DT50: 24.6 days ( $r^2 = 0.563$ )

DT75: 49.2 days

DT90: 81.6 days

Whole soil profile (study values confirmed by PMRA reviewer; SFO kinetics model):

DT50: 35.5 days ( $r^2 = 0.672$ ).

DT75: 71.1 days.

DT90: 118 days.

Transformation products detected: M800H07 and M800H08.

Dissipation routes: Transformation and leaching.

**Study Acceptability:** This study is classified **acceptable/fully reliable**. No significant deviations from good scientific practices were noted.

Chemical name Saflufenacil  
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 Guideline No. 835.6100

Site 3 (Manitoba)  
 0-7.5 cm depth

|            |      |            |      |
|------------|------|------------|------|
| Linear     |      | Non-linear |      |
| DT50 (d) = | 24.6 | DT50 (d) = | 39.4 |
| DT75 (d) = | 49.2 | DT75 (d) = | 78.7 |
| DT90 (d) = | 81.6 | DT90 (d) = | 131  |

\*Calculated using all replicate data following the maximum mean detection following application (1- to 90-day data); values <LOQ are assumed 1/2 LOQ.

| Days posttreatment | Sample replicate | Saflufenacil (ppm) | Ln     | Est.      | SE          | Y^2      |
|--------------------|------------------|--------------------|--------|-----------|-------------|----------|
| 1                  | A                | 0.15               | -1.897 | 0.1157571 | 0.001172575 | 0.0225   |
| 1                  | B                | 0.13               | -2.040 | 0.1157571 | 0.00020286  | 0.0169   |
| 1                  | C                | 0.14               | -1.966 | 0.1157571 | 0.000587717 | 0.0196   |
| 4                  | A                | 0.06               | -2.813 | 0.1097994 | 0.002479976 | 0.0036   |
| 4                  | B                | 0.08               | -2.526 | 0.1097994 | 0.000888002 | 0.0064   |
| 4                  | C                | 0.11               | -2.207 | 0.1097994 | 4.02561E-08 | 0.0121   |
| 6                  | A                | 0.07               | -2.659 | 0.1059989 | 0.001295918 | 0.0049   |
| 6                  | B                | 0.12               | -2.120 | 0.1059989 | 0.000196032 | 0.0144   |
| 6                  | C                | 0.16               | -1.833 | 0.1059989 | 0.002916123 | 0.0256   |
| 8                  | A                | 0.12               | -2.120 | 0.1023299 | 0.000312232 | 0.0144   |
| 8                  | B                | 0.12               | -2.120 | 0.1023299 | 0.000312232 | 0.0144   |
| 8                  | C                | 0.005              | -5.298 | 0.1023299 | 0.009473111 | 0.000025 |
| 10                 | A                | 0.06               | -2.813 | 0.098788  | 0.001504505 | 0.0036   |
| 10                 | B                | 0.09               | -2.408 | 0.098788  | 7.72281E-05 | 0.0081   |
| 10                 | C                | 0.13               | -2.040 | 0.098788  | 0.000974192 | 0.0169   |
| 15                 | A                | 0.06               | -2.813 | 0.0904602 | 0.000927823 | 0.0036   |
| 15                 | B                | 0.10               | -2.303 | 0.0904602 | 9.10081E-05 | 0.01     |
| 15                 | C                | 0.12               | -2.120 | 0.0904602 | 0.000872601 | 0.0144   |
| 20                 | A                | 0.05               | -2.996 | 0.0828344 | 0.0010781   | 0.0025   |
| 20                 | B                | 0.09               | -2.408 | 0.0828344 | 5.13452E-05 | 0.0081   |
| 20                 | C                | 0.10               | -2.303 | 0.0828344 | 0.000294656 | 0.01     |
| 30                 | A                | 0.05               | -2.996 | 0.0694573 | 0.000378587 | 0.0025   |
| 30                 | B                | 0.08               | -2.526 | 0.0694573 | 0.000111149 | 0.0064   |
| 30                 | C                | 0.08               | -2.526 | 0.0694573 | 0.000111149 | 0.0064   |
| 45                 | A                | 0.12               | -2.120 | 0.0533308 | 0.004444778 | 0.0144   |
| 45                 | B                | 0.11               | -2.207 | 0.0533308 | 0.003211395 | 0.0121   |
| 45                 | C                | 0.11               | -2.207 | 0.0533308 | 0.003211395 | 0.0121   |
| 60                 | A                | 0.02               | -3.912 | 0.0409486 | 0.000438843 | 0.0004   |
| 60                 | B                | 0.02               | -3.912 | 0.0409486 | 0.000438843 | 0.0004   |
| 60                 | C                | 0.04               | -3.219 | 0.0409486 | 8.99791E-07 | 0.0016   |
| 75                 | A                | 0.005              | -5.298 | 0.0314412 | 0.000699137 | 0.000025 |
| 75                 | B                | 0.01               | -5.298 | 0.0314412 | 0.000699137 | 0.000025 |
| 75                 | C                | 0.02               | -3.912 | 0.0314412 | 0.000130901 | 0.0004   |
| 90                 | A                | 0.005              | -5.298 | 0.0241412 | 0.000366387 | 0.000025 |
| 90                 | B                | 0.01               | -4.605 | 0.0241412 | 0.000199975 | 0.0001   |
| 90                 | C                | 0.01               | -4.605 | 0.0241412 | 0.000199975 | 0.0001   |

\* Data obtained from Appendix B, Table B3, p. 68 and Appendix D, Table X, p. 146 of the study report.

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

### I. MATERIALS AND METHODS

#### **GUIDELINE FOLLOWED:**

The study was conducted according to USEPA Pesticide Assessment Guidelines Subdivision N, 164-1, OPPTS 835.6100, and the NAFTA Guidance Document for Conducting Terrestrial Field Dissipation Studies (pp. 10, 15). No significant deviations from the objectives of Subdivision N guidelines were noted.

#### **COMPLIANCE:**

The study was conducted in compliance with USEPA FIFRA (40 CFR, Part 160) Good Laboratory Practice standards (pp. 3, 10, 15). Signed and dated Data Confidentiality, GLP Compliance, Quality Assurance, and Authenticity statements were provided (pp. 2-5).

#### **A. MATERIALS:**

##### **1. Test Material**

Saflufenacil (BAS 800 H; Table 1, p. 29).

##### **Chemical Structure of the active ingredient(s):**

See DER Attachment 1.

##### **Description:**

Cream colored liquid (Table 3, p. 31).

##### **Storage conditions of test chemicals:**

Not reported.

#### **Physico-chemical properties of the active ingredient(s):**

| Parameter                                 |             | Value  | Comment  |
|---|-------------|--|--|
| Molecular weight (g/Mol)                  |             | 500.86   |  |
| Molecular formula                         |             | C <sub>17</sub> H <sub>17</sub> ClF <sub>4</sub> N <sub>4</sub> O <sub>5</sub> S |  |
| Water solubility (mg/L)                   | pH 4, 20°C: | 14 (pH 4, 20°C)  |  |
|   | pH 5, 20°C: | 25 (pH 5, 20°C)  |  |
|   | pH 7, 20°C: | 2100 (pH 7, 20°C)  |  |
|   | pH 9, 20°C: | Not determined due to degradation.   |  |
| Vapor pressure                            | 20°C:       | 4.5 x 10 <sup>-15</sup> Pa   | Indicates nonvolatility.   |
|   | 25°C:       | 2.0 x 10 <sup>-14</sup> Pa   |  |
| UV Absorption                             | pH 1, pH 7: | UV/VIS λ <sub>max</sub> = 272 nm   | Indicates possible susceptibility to direct photolysis at alkaline pH. |
|   | pH 12:      | UV/VIS λ <sub>max</sub> = 309 nm   |  |
| pKa                                       |             | 4.41   | Indicates neutrality at ambient pH.                                    |
| K <sub>ow</sub>                           |             | 368  | Indicates low potential to bioconcentrate.                             |
| log K <sub>ow</sub>                       |             | 2.56   |  |
| Stability of compound at room temperature |             | Stable for >2 yrs.   |  |

Data obtained from Genari, 2007 (MRID 47127814); Beery, 2007 (MRID 47127815); Beery, 2006 (MRID 47127817); Vanhook, 2005 (MRID 47127818); Vanhook, 2005a (MRID 47127819); and Kroel, 2005 (MRID 47127821).

Chemical name Saflufenacil  
 PC code 118203  
 MRID 47128235  
 Guideline No. 835.6100

Site 2 (Illinois)  
 0-7.5 cm depth

C0 0.13195872  
 k 0.06234832  
 t 1/2 11.1173345  
 SSE 0.01237333  
 R^2 0.81409158

#### ANOVA

| Source | Df | SS          | MS        | F           | p           |
|--------|----|-------------|-----------|-------------|-------------|
| Reg    | 1  | 0.054182729 | 0.0541827 | 135.7487689 | 7.38921E-13 |
| Error  | 31 | 0.012373332 | 0.0003991 |             |             |
| Total  | 32 | 0.066556061 |           |             |             |

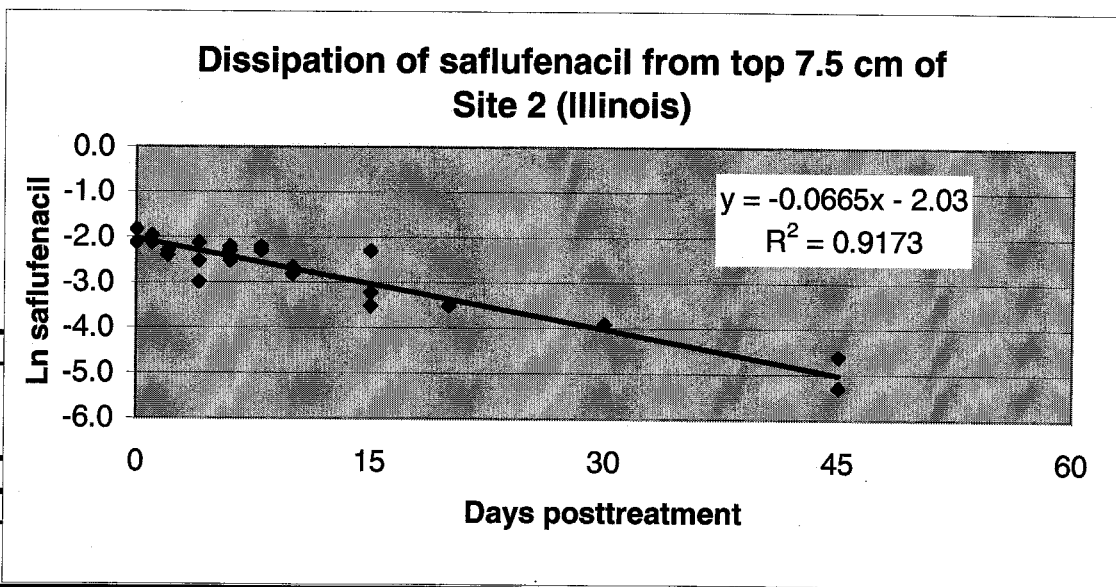
#### SUMMARY OUTPUT

| Regression Statistics |            |
|-----------------------|------------|
| Multiple R            | 0.95773697 |
| R Square              | 0.91726011 |
| Adjusted R Square     | 0.91459108 |
| Standard Error        | 0.27524981 |
| Observations          | 33         |

#### ANOVA

|            | df | SS          | MS        |
|------------|----|-------------|-----------|
| Regression | 1  | 26.03714213 | 26.037142 |
| Residual   | 31 | 2.348636167 | 0.0757625 |
| Total      | 32 | 28.3857783  |           |

|              | Coefficients | Standard Error | t Stat    |
|--------------|--------------|----------------|-----------|
| Intercept    | -2.0300139   | 0.066399956    | -30.57252 |
| X Variable 1 | -0.0664822   | 0.003586211    | -18.53829 |



## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

**2. Test site:** The study was conducted on three test sites (two from the United States and one from Canada; p. 15). Site 1 (R06140) was located near the city of Proctor, in Crittenden County, Arkansas (Table 4, pp. 31-32). The test site soil was a silt loam (0-30 cm) over loam (30-45 cm; Table 5, p. 33). Temik, Flomet, Prowl, Orthene, Dimethoate, Centric, Pix, Diurex, MSMA, Bidrin, Aim, Prep, Liberty, Trimex, Karmax, Ridomil, Roundup, Steward, and Larvin were applied to the test plots in 2003, 2004 and/or 2005. Site 2 (R06141) was located near the city of Carlyle, in Clinton County, Illinois. The test site soil was a silt loam (0-30 cm) over silty clay loam (30-45 cm). Bicep II Magnum and Warrior were applied to the test plots in 2003 and/or 2004. Site 3 (R06142) was located near the city of Portage la Prairie, in Manitoba, Canada. The test site soil was a loam (0-15 cm) over clay loam (15-45 cm; see footnote to Table 3c). Puma Super and Buctril M were applied to the test plots in 2003. The study authors stated that each test site was located in an area representative of the field and row crop use pattern (p. 11).

Table 1: Geographic location, site description, and climatic data at the study sites.

| Details  |                | Site 1: Arkansas   | Site 2: Illinois  | Site 3: Manitoba  |
|--|----------------|--|---|---|
| Geographic coordinates   | Latitude       | N35.08188°   | N38.69738°  | N49°57.950  |
|  | Longitude      | W90.25516°   | W89.34105°  | W98°15.968  |
|  | Province/State | Arkansas   | Illinois  | Manitoba  |
|  | Country        | US   | US  | Canada  |
|  | Ecoregion      | 8.5.2  | 8.3.2   | 9.2.2   |
| Slope Gradient   |                | 0-1%   | 0-1%  | 0-1%  |
| Depth to ground water (m)  |                | 5.5 m  | 1.5 m   | 0.898 m   |
| Distance from weather station used for climatic measurements   |                | Daily precipitation, minimum and maximum air temperature, wind speed and direction, solar radiation, percent humidity, and other climatic measurements were collected on-site or from nearby weather stations (ca. 15 miles ESE of plots). | Daily precipitation, minimum and maximum air temperature, wind speed and direction, solar radiation, percent humidity, and other climatic measurements were collected on-site or from nearby weather stations (ca. 5 miles S of plots). | Daily precipitation, minimum and maximum air temperature, wind speed and direction, solar radiation, percent humidity, and other climatic measurements were collected on-site or from nearby weather stations (ca. 3.7 miles E of plots). |
| Indicate whether the meteorological conditions before starting or during the study were within 30 year normal levels (Yes/No). If no, provide details. |                | Total water input (precipitation plus irrigation) during the study period was 55.2 inches or approximately 96.7% of the historical average rainfall expected during the study period.  | Total water input (precipitation plus irrigation) during the study period was 62.9 inches or approximately 108.4% of the historical average rainfall expected during the study period.  | Total water input (precipitation plus irrigation) during the study period was 22.37 inches or approximately 100.2% of the historical average rainfall expected during the study period.   |

Data were obtained from p. 15; Table 4, p. 31; Table 8, p. 35; and Tables 12-15, pp. 39-42 of the study report.

Chemical name Saflufenacil  
 PC code 118203  
 MRID 47128235  
 Guideline No. 835.6100

Site 2 (Illinois)  
 0-7.5 cm depth

|            |      |            |      |
|------------|------|------------|------|
| Linear     |      | Non-linear |      |
| DT50 (d) = | 10.4 | DT50 (d) = | 11.1 |
| DT75 (d) = | 20.9 | DT75 (d) = | 22.2 |
| DT90 (d) = | 34.6 | DT90 (d) = | 36.9 |

\*Calculated using all replicate data following the maximum mean detection (0- to 45-day data); values <LOQ are assumed 1/2 LOQ.

| Days posttreatment | Sample replicate | Saflufenacil (ppm) | Ln     | Est.        | SE          | Y^2      |
|--------------------|------------------|--------------------|--------|-------------|-------------|----------|
| 0                  | A                | 0.12               | -2.120 | 0.131958716 | 0.000143011 | 0.0144   |
| 0                  | B                | 0.16               | -1.833 | 0.131958716 | 0.000786314 | 0.0256   |
| 0                  | C                | 0.16               | -1.833 | 0.131958716 | 0.000786314 | 0.0256   |
| 1                  | A                | 0.12               | -2.120 | 0.123982545 | 1.58607E-05 | 0.0144   |
| 1                  | B                | 0.12               | -2.120 | 0.123982545 | 1.58607E-05 | 0.0144   |
| 1                  | C                | 0.14               | -1.966 | 0.123982545 | 0.000256559 | 0.0196   |
| 2                  | A                | 0.09               | -2.408 | 0.11648849  | 0.00070164  | 0.0081   |
| 2                  | B                | 0.10               | -2.303 | 0.11648849  | 0.00027187  | 0.01     |
| 2                  | C                | 0.10               | -2.303 | 0.11648849  | 0.00027187  | 0.01     |
| 4                  | A                | 0.05               | -2.996 | 0.102831921 | 0.002791212 | 0.0025   |
| 4                  | B                | 0.08               | -2.526 | 0.102831921 | 0.000521297 | 0.0064   |
| 4                  | C                | 0.12               | -2.120 | 0.102831921 | 0.000294743 | 0.0144   |
| 6                  | A                | 0.08               | -2.526 | 0.090776384 | 0.00011613  | 0.0064   |
| 6                  | B                | 0.10               | -2.303 | 0.090776384 | 8.50751E-05 | 0.01     |
| 6                  | C                | 0.11               | -2.207 | 0.090776384 | 0.000369547 | 0.0121   |
| 8                  | A                | 0.10               | -2.303 | 0.080134183 | 0.000394651 | 0.01     |
| 8                  | B                | 0.11               | -2.207 | 0.080134183 | 0.000891967 | 0.0121   |
| 8                  | C                | 0.10               | -2.303 | 0.080134183 | 0.000394651 | 0.01     |
| 10                 | A                | 0.06               | -2.813 | 0.070739624 | 0.00011534  | 0.0036   |
| 10                 | B                | 0.07               | -2.659 | 0.070739624 | 5.47044E-07 | 0.0049   |
| 10                 | C                | 0.07               | -2.659 | 0.070739624 | 5.47044E-07 | 0.0049   |
| 15                 | A                | 0.04               | -3.219 | 0.051793479 | 0.000139086 | 0.0016   |
| 15                 | B                | 0.10               | -2.303 | 0.051793479 | 0.002323869 | 0.01     |
| 15                 | C                | 0.03               | -3.507 | 0.051793479 | 0.000474956 | 0.0009   |
| 20                 | A                | 0.03               | -3.507 | 0.037921666 | 6.27528E-05 | 0.0009   |
| 20                 | B                | 0.03               | -3.507 | 0.037921666 | 6.27528E-05 | 0.0009   |
| 20                 | C                | 0.03               | -3.507 | 0.037921666 | 6.27528E-05 | 0.0009   |
| 30                 | A                | 0.02               | -3.912 | 0.020328816 | 1.0812E-07  | 0.0004   |
| 30                 | B                | 0.02               | -3.912 | 0.020328816 | 1.0812E-07  | 0.0004   |
| 30                 | C                | 0.02               | -3.912 | 0.020328816 | 1.0812E-07  | 0.0004   |
| 45                 | A                | 0.01               | -4.605 | 0.007979011 | 4.0844E-06  | 0.0001   |
| 45                 | B                | 0.005              | -5.298 | 0.007979011 | 8.87451E-06 | 0.000025 |
| 45                 | C                | 0.005              | -5.298 | 0.007979011 | 8.87451E-06 | 0.000025 |

\* Data obtained from Appendix B, Table B2, p. 61 and Appendix D, Table IX, p. 139 of the study report.



# **Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

Table 2: Site usage and management history for the previous three years.

| Use   | Year             | Site 1: Arkansas  | Site 2: Illinois   | Site 3: Manitoba   |
|---|------------------|---|--|--|
| Crops grown                                     | Previous year    | Cotton  | Fallow   | Winter wheat   |
|   | 2 years previous | Cotton  | Field corn   | Winter wheat   |
|   | 3 years previous | Cotton  | Field corn   | Barley   |
| Pesticides used                                 | Previous year    | Temik (aldicarb), Flomet (fluometuron), Prowl (pendimethalin), Orthene (acephate), Dimethoate, Centric (thiamethoxam), Pix (mepiquat chloride), Diurex (diuron), MSMA, Bidrin (dicotophos), Aim (carfentrazone-ethyl), Prep (ethephon), and Liberty (glufosinate)                             | None   | None   |
|   | 2 years previous | Temik (aldicarb), Flomet (fluometuron), Prowl (pendimethalin), Liberty (glufosinate), Orthene (acephate), Trimax (imidacloprid), MSMA, Karmex (diuron), Pix (mepiquat chloride), Aim (carfentrazone-ethyl), and Prep (ethephon)   | Bicep II Magnum (metolachlor) and Warrior (lambda-cyhalothrin) | None   |
|   | 3 years previous | Temik (aldicarb), Ridomil (metalaxyl), Flomet (fluometuron), Prowl (pendimethalin), Orthene (acephate), Roundup (glyphosate), Centric (thiamethoxam), Pix (mepiquat chloride), Steward (indoxacarb), Larvin (thiodicarb), Bidrin (dicotophos), Aim (carfentrazone-ethyl), and Prep (ethephon) | Bicep II Magnum (metolachlor)                                  | Puma Super (fenoxaprop-p-ethyl) and Buctril M (bromoxynil) |
| Fertilizers used                                | Previous year    | Not reported  | Not reported   | Not reported   |
|   | 2 years previous | Not reported  | Not reported   | Not reported   |
|   | 3 years previous | Not reported  | Not reported   | Not reported   |
| Cultivation methods, if provided (eg., Tillage) | Previous year    | Not reported  | Not reported   | Not reported   |
|   | 2 years previous | Not reported  | Not reported   | Not reported   |
|   | 3 years previous | Not reported  | Not reported   | Not reported   |

Data were obtained from Table 4, pp. 31-32 of the study report.

Chemical name Saflufenacil  
 PC code 118203  
 MRID 47128235  
 Guideline No. 835.6100

Site 1 (Arkansas)  
 0-7.5 cm depth

C0 0.12609308  
 k 0.06800729  
 t 1/2 10.1922478  
 SSE 0.01690775  
 R^2 0.7510591

#### ANOVA

| Source | Df | SS          | MS        | F        | p           |
|--------|----|-------------|-----------|----------|-------------|
| Reg    | 1  | 0.051010995 | 0.051011  | 102.5786 | 8.41185E-12 |
| Error  | 34 | 0.016907755 | 0.0004973 |          |             |
| Total  | 35 | 0.06791875  |           |          |             |

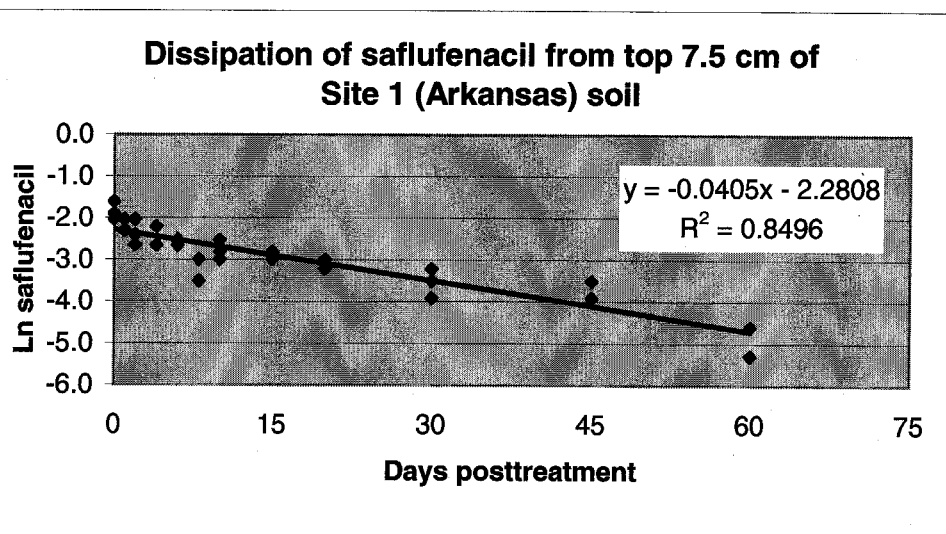
#### SUMMARY OUTPUT

| Regression Statistics |            |
|-----------------------|------------|
| Multiple R            | 0.92175472 |
| R Square              | 0.84963176 |
| Adjusted R Square     | 0.84520916 |
| Standard Error        | 0.32042297 |
| Observations          | 36         |

#### ANOVA

|            | df | SS          | MS        |
|------------|----|-------------|-----------|
| Regression | 1  | 19.72426456 | 19.724265 |
| Residual   | 34 | 3.490809962 | 0.1026709 |
| Total      | 35 | 23.21507453 |           |

|              | Coefficients | Standard Error | t Stat    |
|--------------|--------------|----------------|-----------|
| Intercept    | -2.2807882   | 0.072456109    | -31.4782  |
| X Variable 1 | -0.0405209   | 0.002923495    | -13.86043 |



## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

### 3. Soils:

Table 3a: Properties of the soil from Site 1 (Arkansas).

| Property                                       | Depth (cm)   |           |       |           |           |       |        |         |
|--|--|-----------|-------|-----------|-----------|-------|--------|---------|
|  | 0-15   | 15-30     | 30-45 | 45-60     | 60-75     | 75-90 | 90-105 | 105-120 |
| Textural classification <sup>1</sup>           | Silt loam  | Silt loam | Loam  | Clay loam | Clay loam | Clay  | Clay   | Clay    |
| % Sand   | 26   | 26        | 30    | 30        | 34        | 30    | 40     | 38      |
| % Silt   | 56   | 52        | 44    | 40        | 32        | 26    | 16     | 18      |
| % Clay   | 18   | 22        | 26    | 30        | 34        | 44    | 44     | 44      |
| pH (saturated paste)                           | 6.6  | 6.7       | 6.8   | 7.0       | 7.2       | 7.1   | 7.1    | 7.2     |
| Organic matter (%)                             | 1.3  | 0.8       | 0.9   | 0.9       | 1.0       | 1.1   | 0.9    | 1.3     |
| Organic carbon (%) <sup>2</sup>                | 0.8  | 0.5       | 0.5   | 0.5       | 0.6       | 0.6   | 0.5    | 0.8     |
| CEC (meq/100 g)                                | 10.4   | 13.9      | 19.5  | 22.7      | 26.9      | 34.7  | 33.3   | 38.2    |
| Bulk density (g/cm <sup>3</sup> ) <sup>3</sup> | 1.26   | 1.36      | 1.36  | 1.26      | 1.27      | 1.29  | 1.31   | 1.31    |
| Moisture at 1/3 atm (%)                        | 21.5   | 30.5      | 34.8  | 35.6      | 39.7      | 43.5  | 46.5   | 47.1    |
| Taxonomic classification <sup>4</sup>          | Fine-silty, mixed, superactive, nonacid thermic Fluvaquentic Endoaquept. |           |       |           |           |       |        |         |
| Soil mapping unit                              | Not reported.  |           |       |           |           |       |        |         |

Data were obtained from p. 13 and Table 5, p. 33 of the study report.

1 Textural classifications were determined by the reviewer using the NRCS soil texture calculator <http://soils.usda.gov/technical/aids/investigations/texture/>, which calculates texture based on the percent sand and clay.

2 Reviewer-calculated as % organic matter ÷ 1.72.

3 Undisturbed bulk density.

4 Taxonomic classification determined by the study authors and confirmed by reviewer from the soil series "Commerce" (p. 15 of the study report) and <http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi>.

Chemical name Saflufenacil  
 PC code 118203  
 MRID 47128235  
 Guideline No. 835.6100

Site 1 (Arkansas)  
 0-7.5 cm depth

|            |      |            |      |
|------------|------|------------|------|
| Linear     |      | Non-linear |      |
| DT50 (d) = | 17.1 | DT50 (d) = | 10.2 |
| DT75 (d) = | 34.2 | DT75 (d) = | 20.4 |
| DT90 (d) = | 56.8 | DT90 (d) = | 33.9 |

\*Calculated using all replicate data following the maximum mean detection (0- to 60-day data); values <LOQ are assumed 1/2 LOQ.

| Days<br>posttreatment | Sample<br>replicate | Saflufenacil<br>(ppm) | Ln     | Est.      | SE          | Y^2      |
|-----------------------|---------------------|-----------------------|--------|-----------|-------------|----------|
| 0                     | A                   | 0.15                  | -1.897 | 0.1260931 | 0.000571541 | 0.0225   |
| 0                     | B                   | 0.13                  | -2.040 | 0.1260931 | 1.5264E-05  | 0.0169   |
| 0                     | C                   | 0.2                   | -1.609 | 0.1260931 | 0.005462232 | 0.04     |
| 1                     | A                   | 0.10                  | -2.303 | 0.1178029 | 0.000316944 | 0.01     |
| 1                     | B                   | 0.10                  | -2.303 | 0.1178029 | 0.000316944 | 0.01     |
| 1                     | C                   | 0.13                  | -2.040 | 0.1178029 | 0.000148769 | 0.0169   |
| 2                     | A                   | 0.13                  | -2.040 | 0.1100578 | 0.000397691 | 0.0169   |
| 2                     | B                   | 0.09                  | -2.408 | 0.1100578 | 0.000402316 | 0.0081   |
| 2                     | C                   | 0.07                  | -2.659 | 0.1100578 | 0.001604629 | 0.0049   |
| 4                     | A                   | 0.07                  | -2.659 | 0.0960618 | 0.000679215 | 0.0049   |
| 4                     | B                   | 0.11                  | -2.207 | 0.0960618 | 0.000194275 | 0.0121   |
| 4                     | C                   | 0.11                  | -2.207 | 0.0960618 | 0.000194275 | 0.0121   |
| 6                     | A                   | 0.07                  | -2.659 | 0.0838456 | 0.0001917   | 0.0049   |
| 6                     | B                   | 0.08                  | -2.526 | 0.0838456 | 1.47884E-05 | 0.0064   |
| 6                     | C                   | 0.07                  | -2.659 | 0.0838456 | 0.0001917   | 0.0049   |
| 8                     | A                   | 0.03                  | -3.507 | 0.0731829 | 0.001864765 | 0.0009   |
| 8                     | B                   | 0.05                  | -2.996 | 0.0731829 | 0.000537448 | 0.0025   |
| 8                     | C                   | 0.05                  | -2.996 | 0.0731829 | 0.000537448 | 0.0025   |
| 10                    | A                   | 0.08                  | -2.526 | 0.0638762 | 0.000259976 | 0.0064   |
| 10                    | B                   | 0.05                  | -2.996 | 0.0638762 | 0.00019255  | 0.0025   |
| 10                    | C                   | 0.06                  | -2.813 | 0.0638762 | 1.50252E-05 | 0.0036   |
| 15                    | A                   | 0.05                  | -2.996 | 0.0454636 | 2.05793E-05 | 0.0025   |
| 15                    | B                   | 0.06                  | -2.813 | 0.0454636 | 0.000211308 | 0.0036   |
| 15                    | C                   | 0.05                  | -2.996 | 0.0454636 | 2.05793E-05 | 0.0025   |
| 20                    | A                   | 0.04                  | -3.219 | 0.0323584 | 5.83936E-05 | 0.0016   |
| 20                    | B                   | 0.05                  | -2.996 | 0.0323584 | 0.000311225 | 0.0025   |
| 20                    | C                   | 0.05                  | -2.996 | 0.0323584 | 0.000311225 | 0.0025   |
| 30                    | A                   | 0.02                  | -3.912 | 0.0163921 | 1.30167E-05 | 0.0004   |
| 30                    | B                   | 0.04                  | -3.219 | 0.0163921 | 0.000557331 | 0.0016   |
| 30                    | C                   | 0.03                  | -3.507 | 0.0163921 | 0.000185174 | 0.0009   |
| 45                    | A                   | 0.02                  | -3.912 | 0.0059103 | 0.00019852  | 0.0004   |
| 45                    | B                   | 0.03                  | -3.507 | 0.0059103 | 0.000580315 | 0.0009   |
| 45                    | C                   | 0.02                  | -3.912 | 0.0059103 | 0.00019852  | 0.0004   |
| 60                    | A                   | 0.01                  | -4.605 | 0.002131  | 6.19214E-05 | 0.0001   |
| 60                    | B                   | 0.005                 | -5.298 | 0.002131  | 8.23127E-06 | 0.000025 |
| 60                    | C                   | 0.01                  | -4.605 | 0.002131  | 6.19214E-05 | 0.0001   |

\* Data obtained from Appendix B, Table B1, p. 54 and Appendix D, Table VIII, p. 132 of the study report.

# **Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

Table 3b: Properties of the soil from Site 2 (Illinois).

| Property                                       | Depth (cm)   |           |                 |            |                 |           |           |           |
|--|--|-----------|-----------------|------------|-----------------|-----------|-----------|-----------|
|  | 0-15   | 15-30     | 30-45           | 45-60      | 60-75           | 75-90     | 90-105    | 105-120   |
| Textural classification <sup>1</sup>           | Silt loam  | Silt loam | Silty clay loam | Silty clay | Silty clay loam | Silt loam | Silt loam | Silt loam |
| % Sand   | 6.5  | 6.0       | 5.8             | 1.0        | 11.9            | 8.6       | 10.4      | 8.0       |
| % Silt   | 77.3   | 74.6      | 66.4            | 58.6       | 53.2            | 76.9      | 67.1      | 74.5      |
| % Clay   | 16.2   | 19.4      | 27.8            | 40.4       | 34.9            | 14.5      | 22.5      | 17.5      |
| pH (saturated paste)                           | 5.90   | 5.21      | 4.86            | 4.95       | 5.05            | 5.19      | 5.55      | 6.18      |
| Organic matter (%)                             | 2.86   | 1.78      | 1.72            | 2.27       | 2.41            | 2.01      | 1.21      | 1.09      |
| Organic carbon (%) <sup>2</sup>                | 1.7  | 1.0       | 1.0             | 1.3        | 1.4             | 1.2       | 0.7       | 0.6       |
| CEC (meq/100 g)                                | 14.7   | 15.6      | 19.6            | 29.9       | 33.5            | 28.4      | 26.9      | 22.7      |
| Bulk density (g/cm <sup>3</sup> ) <sup>3</sup> | 1.53   | 1.65      | 1.65            | 1.57       | 1.70            | 1.70      | 1.69      | 1.65      |
| Moisture at 1/3 atm (%)                        | 24.6   | 24.3      | 25.8            | 28.8       | 31.0            | 28.7      | 27.5      | 25.3      |
| Taxonomic classification <sup>4</sup>          | Cisne – Fine, smectitic, mesic Mollic Albaqualf<br>Huey – Fine-silty, mixed, superactive, mesic Typic Natraqualf |           |                 |            |                 |           |           |           |
| Soil mapping unit                              | Not reported.  |           |                 |            |                 |           |           |           |

Data were obtained from p. 14 and Table 6, p. 33 of the study report.

1 Textural classifications were determined by the reviewer using the NRCS soil texture calculator

<http://soils.usda.gov/technical/aids/investigations/texture/>, which calculates texture based on the percent sand and clay.

2 Reviewer-calculated as % organic matter ÷ 1.72.

3 Undisturbed bulk density.

4 Taxonomic classification determined by the study authors and confirmed by the reviewer for the soil series “Cisne-Huey Complex” (p. 15 of the study report) and <http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi>.

## **Attachment 2: Excel Spreadsheets**

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

Table 3c: Properties of the soil from Site 3 (Manitoba).

| Property                                       | Depth (cm)    |           |           |       |       |       |        |         |
|--|---------------|-----------|-----------|-------|-------|-------|--------|---------|
|  | 0-15          | 15-30     | 30-45     | 45-60 | 60-75 | 75-90 | 90-105 | 105-120 |
| Textural classification <sup>1</sup>           | Loam          | Clay loam | Clay loam | Loam  | Loam  | Loam  | Loam   | Loam    |
| % Sand   | 47            | 35        | 39        | 43    | 39    | 37    | 41     | 39      |
| % Silt   | 38            | 38        | 32        | 34    | 39    | 42    | 40     | 40      |
| % Clay   | 15            | 27        | 29        | 23    | 22    | 21    | 19     | 21      |
| pH (saturated paste)                           | 8.2           | 8.7       | 8.8       | 8.8   | 8.7   | 8.6   | 8.5    | 8.3     |
| Organic matter (%)                             | 5.6           | 2.5       | 0.9       | 0.7   | 0.5   | 0.4   | 0.4    | 0.4     |
| Organic carbon (%) <sup>2</sup>                | 3.3           | 1.5       | 0.5       | 0.4   | 0.3   | 0.2   | 0.2    | 0.2     |
| CEC (meq/100 g)                                | 32.8          | 27.6      | 22.3      | 19.8  | 19.6  | 18.6  | 18.7   | 19.0    |
| Bulk density (g/cm <sup>3</sup> ) <sup>3</sup> | 1.07          | 1.08      | 1.14      | 1.15  | 1.18  | 1.20  | 1.26   | 1.28    |
| Moisture at 1/3 atm (%)                        | 39.0          | 33.8      | 26.7      | 24.5  | 24.0  | 24.5  | 25.3   | 24.3    |
| Taxonomic classification <sup>4</sup>          | Not reported. |           |           |       |       |       |        |         |
| Soil mapping unit                              | Not reported. |           |           |       |       |       |        |         |

Data were obtained from p. 14 and Table 7, p. 34 of the study report.

1 Textural classifications were determined by the reviewer using the NRCS soil texture calculator

<http://soils.usda.gov/technical/aids/investigations/texture/>, which calculates texture based on the percent sand and clay.

The study authors reported that the soil texture for the 15-30 cm section was loam. The reviewer notes that the soil texture falls along the loam/clay loam classification line.

2 Reviewer-calculated as % organic matter ÷ 1.72.

3 Undisturbed bulk density.

4 The study authors reported that the soil was "Neuhorst" (p. 15 of the study report); however, this soil was not found using the website <http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi>. The study authors reported that the soil type was Gleyed Carbonated Rego Black (p. 14 of the study report).

## B. EXPERIMENTAL DESIGN:

### 1. Experimental design:

Table 4: Experimental design.

| Details  |            | Site 1: Arkansas | Site 2: Illinois | Site 3: Manitoba |
|--|------------|------------------|------------------|------------------|
| Duration of study                              |            | 363 days         | 363 days         | 357 days         |
| Uncropped (bare) or cropped                    |            | Bare             | Bare             | Bare             |
| Control used (Yes/No)                          |            | Yes              | Yes              | Yes              |
| No. of replications                            | Controls   | One              | Three            | One              |
|  | Treatments | Three            | Three            | Three            |
| Plot size (L x W m)                            | Controls   | 7.3 x 39.6 m     | 3.1 x 10.7 m     | 6 x 34 m         |
|  | Treatments | 7.3 x 45.7 m     | 3.1 x 22.9 m     | 6 x 32 m         |
| Distance between control plot and treated plot |            | 15.2 m           | 15.2 m           | 15 m             |

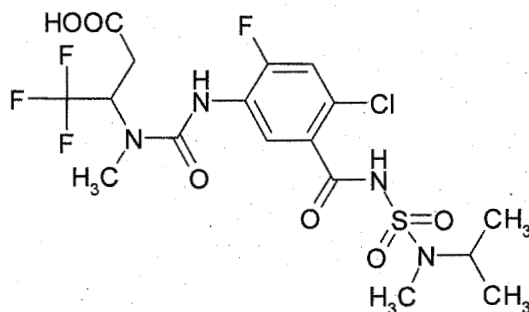
## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

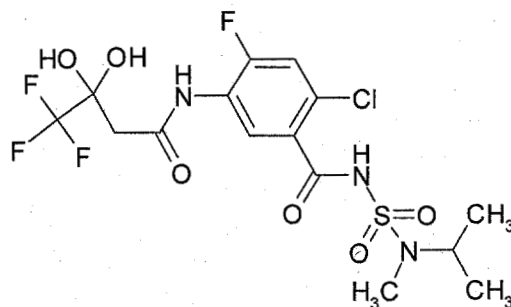
M800H22 [5216337]

**IUPAC Name:** 3-[(4-Chloro-2-fluoro-5-  
[[[isopropyl(methyl)amino]sulfonyl]amino]carbonyl]anilino)carbonyl](methylamino)-4,4,4-trifluorobutanoic acid.  
**CAS Name:** Not reported.  
**CAS Number:** Not reported.



M800H15 [M800H15-ketohydrate, "Ketohydrate", 5264357]

**IUPAC Name:** N-{4-Chloro-2-fluoro-5-  
[[[isopropyl(methyl)amino]sulfonyl]amino]carbonyl]phenyl}-4,4,4-trifluoro-3,3-dihydroxybutanamide.  
**CAS Name:** Not reported.  
**CAS Number:** Not reported.





# Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

| Details   |                                | Site 1: Arkansas   | Site 2: Illinois   | Site 3: Manitoba  |
|---|--------------------------------|--|--|---|
| Distance between treated plots  |                                | 1.8 m  | 6.1 m  | 6 m   |
| Application rate(s) used (g a.i./ha)  |                                | 150 g a.i./ha  | 150 g a.i./ha  | 150 g a.i./ha   |
| Was the maximum label rate per ha used in study? (Yes/No)   |                                | Yes <sup>1</sup>   | Yes <sup>1</sup>   | Yes <sup>1</sup>  |
| Number of applications  |                                | One  | One  | One   |
| Application Date(s) (dd mm yyyy)  |                                | 02/05/2006   | 23/05/2006   | 26/05/2006  |
| Concentration expected in the 0-7.5 cm soil zone, based on the target first application rate and soil density (mg a.i./kg soil) |                                | 0.159 mg a.i./kg soil <sup>2</sup>   | 0.131 mg a.i./kg soil <sup>2</sup>   | 0.187 mg a.i./kg soil <sup>2</sup>  |
| Application method (eg., spraying, broadcast etc.)  |                                | Broadcast  | Broadcast  | Broadcast   |
| Type of spray equipment, if used  |                                | CO <sub>2</sub> powered canister and 12 ft off set boom fitted with eight (AII 1004) flat fan nozzles. | CO <sub>2</sub> powered canister and 15 ft off set boom fitted with six (8005) flat fan nozzles. | CO <sub>2</sub> powered canister and 3 m off set boom fitted with six (11001) flat fan nozzles. |
| Total volume of spray solution applied/plot <b>OR</b> total amount broadcasted/plot   |                                | 38.396 L   | 30.568 L   | 7.66-7.75 L   |
| Identification and volume of carrier (e.g., water), if used   |                                | Water, 44.815 L  | Water, 18.748 L  | Water, 14.495 L   |
| Name and concentration of co-solvents, adjuvants and/or surfactants, if used  |                                | Agri-Dex Surfactant and ammonium sulfate   | Crop oil concentrate and ammonium sulfate  | Crop oil concentrate and ammonium sulfate   |
| Indicate whether the following monthly reports were submitted:  |                                |  |  |   |
| Precipitation:  |                                | Yes  | Yes  | Yes   |
| Average minimum and maximum air temperature:  |                                | Yes  | Yes  | Yes   |
| Average minimum and maximum soil temperature:   |                                | Yes (at 5, 10, and 20 cm)  | Yes (at 5, 10, and 20 cm)  | Yes (at 5 cm)   |
| Average annual frost-free periods:  |                                | Yes  | Yes  | Yes   |
| Indicate whether the Pan evaporation data were submitted  |                                | No, Penman evaporation data were reported.   | No, Penman evaporation data were reported.   | No, Penman evaporation data were reported.  |
| Meteorological conditions during application  | Cloud cover (%)                | 100  | 0  | 85  |
|   | Temperature (°C)               | 21.1   | 12.8   | 11.9  |
|   | Humidity                       | 97%  | 56%  | 62%   |
|   | Wind speed and direction (mph) | 2-4, SW.   | 2-4, E.  | 5.6-6.8, NE.  |
|   | Sunlight (hr)                  | Not reported   | Not reported   | Not reported  |

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

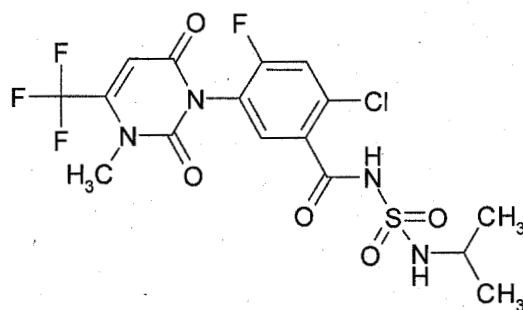
EPA MRID Number 47128235

PMRA Submission Number 2008-0430

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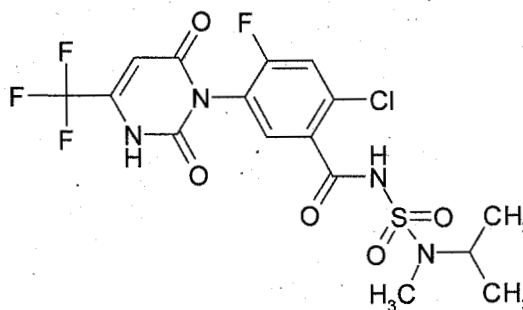
M800H01 [4118561]

**IUPAC Name:** N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N'-isopropylsulfamide.  
**CAS Name:** Not reported.  
**CAS Number:** Not reported.



M800H02 [4118416]

**IUPAC Name:** N'-[2-Chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydropyrimidin-1(2H)-yl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide.  
N'-[2-Chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide.  
**CAS Name:** Not reported.  
**CAS Number:** Not reported.



# **Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

| Details  | Site 1: Arkansas                                      | Site 2: Illinois                                    | Site 3: Manitoba  |
|--|---|---|---|
| Pesticides used during study:  |   |   |   |
| Name of product/a.i conc.:<br>Amount applied:  | Roundup 5.5 EC<br>Five applications at 1.0 lb a.i./A. | Glyphosate<br>Eleven applications at 1.0 lb a.i./A. | Roundup<br>Five applications at 1.02 lb a.i./A; one application at 2.38 lb a.i./A; and one application at 1.12 lb a.i./A. |
| Application method:  | Broadcast   | Broadcast   | Broadcast   |
| Supplemental irrigation used (Yes/No) <sup>3</sup>   | Yes.  | Yes.  | Yes.  |
| If yes, provide the following details:   |   |   |   |
| No. of irrigation:   | 10  | 56  | 16  |
| Interval between irrigation:   | 1-49 days   | 1-19 days   | 1-19 days   |
| Amount of water added each time:   | 0.50-2.05 inches                                      | 0.20-0.50 inches                                    | 0.10-0.60 inches  |
| Method of irrigation:  | Overhead sprinkler                                    | Overhead sprinkler                                  | Overhead sprinkler  |
| Indicate whether water received through rainfall + irrigation equals the 30 year average rainfall (Yes/No) | No  | Yes   | Yes   |
| Were the application concentrations verified?  | Yes   | Yes   | Yes   |
| Were field spikes used?  | Yes   | Yes   | Yes   |
| Good agricultural practices followed (Yes or No)   | Yes   | Yes   | Yes   |
| Indicate if any abnormal climatic events occurred during the study   | None  | None  | None  |
| If cropped plots are used, provide the following details:  | N/A   | N/A   | N/A   |
| Plant - Common name/variety:<br>Details of planting:<br>Crop maintenance:                                  |   |   |   |
| Volatilization included in the study (Yes/No)  | No  | No  | No  |
| Leaching included in the study (Yes/No)  | Yes   | Yes   | Yes   |
| Run off included in the study (Yes/No)   | No  | No  | No  |

Data were obtained from p. 11; pp. 15-16; Table 4, p. 31; Tables 8-11, pp. 35-38; Appendix C, pp. 77-107; Appendix F, Table A1-1-A1-3, pp. 505-519 of the study report.

1 The study authors stated that the applications were made according to the proposed label for field and row crops (p. 11 of the study report).

2 Calculated using soil bulk density from the 0-15 cm soil depth.

3 For Site 1 (Arkansas), Table 12 reports that the amount of water added each time was between 0.38-2.05 inches; for Site 3 (Manitoba), Table 12 reports that the amount of water added each time was between 0.10-0.55 inches (p. 39 of the study report). However, the daily irrigation amounts reported in Appendix F give the ranges of 0.50-2.05 inches and 0.10-0.60 for Sites 1 and 3, respectively.

## **Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

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### **Unidentified Reference Compounds**

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

**2. Application Verification:** The application rate was verified for each test site using a product called Speedisk™, which resembles a short walled Buchner funnel with C18 placed in the “bottom” of the funnel (p. 15). To verify the application, ten Speedisk™’s were placed randomly in each of the three replicate subplots at each test site (30 total) prior to application (Table 16, p. 43).

Following the test application, the Speedisk™’s were collected and used to create three composite samples (one per replicate subplot). Speedisk™ samples were eluted with acetonitrile, and the extracts were serial diluted using acetonitrile:water (70:30, v:v) and analyzed for saflufenacil by LC/MS/MS, as described for the study soil samples (Appendix D, pp. 114-115).

**3. Field Spiking:** Field spikes were prepared by fortifying untreated soil samples (20 g, 1 mm sieved) with saflufenacil at 2.5 µg/g (p. 16). Three field spike samples were prepared at the 0, 4, 10, 30, 90, 270, and 360 day sampling intervals (Appendix B, Table III, pp. 17-18). Field spike samples were transported with and maintained under the same conditions as the test samples. Field spikes were analyzed within 518 days of storage at Site 1, 482 days of storage at Site 2, and 509 days of storage at Site 3 (Appendix A, Tables A1-A3, pp. 50-52).

**4. Volatilization:** Volatilization was not measured at any of the test sites.

**5. Leaching:** Fifteen cores (five from each replicate plot) were collected from each test site to a depth of 0-120 cm to determine the mobility of the test substance in the soil profile (p. 16; Table 16, p. 43). Samples were collected from each site at approximately -1, 0, 1, 2, 4, 6, 8, 10, 15, 20, 30, 45, 60, 75, 90, 120, 150, 180, 270, and 360 days following the test application, with the exception that samples were not collected at Site 2 at the 2-, 180- and 270-day posttreatment intervals. Samples were analyzed to a maximum depth of 30-45 cm at each test site (Appendix B, Tables B1-B3, pp. 54-74).

To determine whether residues had an opportunity to move down through the soil profile, a net water balance assessment based on cumulative daily precipitation, irrigation, and evapotranspiration was used to characterize site hydrologic conditions (p. 16 and Appendix F, pp. 494-497). Reference evapotranspiration data were used for the three test sites.

**6. Run off:** Run off was not studied at any of the test sites.

**7. Supplementary Study:** The stability of saflufenacil and the transformation products M800H01, M800H02, M800H07, M800H08, M800H15, and M800H22, fortified to achieve a concentration of 0.10 mg/kg and stored in a freezer for *ca.* 9 months, was determined in a separate ongoing storage stability study using soil from each of the three test sites (p. 17; Gooding and Saha, 2008 (MRID 47128237), p. 9).

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

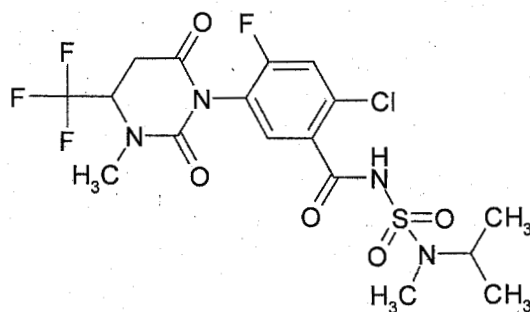
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M800H08 [4773881]

**IUPAC Name:** N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

**CAS Name:** Not reported.

**CAS Number:** Not reported.



# Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

## 8. Sampling:

Table 5: Soil sampling

| Details                                    | Site 1: Arkansas  | Site 2: Illinois  | Site 3: Manitoba  |
|--|---|---|---|
| Method of sampling (random or systematic)  | Not reported <sup>1</sup>   | Not reported <sup>1</sup>   | Not reported <sup>1</sup>   |
| Sampling intervals                         | -1, 0, 1, 3, 4, 6, 9, 10, 15, 20, 30, 45, 60, 76, 90, 118, 150, 181, 272, and 363 days.   | -1, 0, 1, 2, 4, 6, 8, 10, 15, 20, 30, 45, 58, 73, 90, 121, 150, 182, 289, and 363 days.   | -1, 0, 1, 2, 4, 6, 8, 10, 15, 20, 30, 45, 60, 75, 89, 119, 150, 180, 270, and 357 days.   |
| Method of soil collection (eg., cores)     | 0-15 and 15-120 cm cores  | 0-15 and 15-120 cm cores  | 0-15 and 15-120 cm cores  |
| Sampling depth                             | 120 cm <sup>2</sup>   | 120 cm <sup>2</sup>   | 120 cm <sup>2</sup>   |
| Number of cores collected per plot         | 15 (Five per replicate plot)  | 15 (Five per replicate plot)  | 15 (Five per replicate plot)  |
| Number of segments per core                | Nine (0-7.5, 7.5-15, 15-30, 30-45, 45-60, 60-75, 75-90, 90-105, and 105-120 cm)   | Nine (0-7.5, 7.5-15, 15-30, 30-45, 45-60, 60-75, 75-90, 90-105, and 105-120 cm)   | Nine (0-7.5, 7.5-15, 15-30, 30-45, 45-60, 60-75, 75-90, 90-105, and 105-120 cm)   |
| Length of soil segments (after sectioning) | 7.5 or 15 cm  | 7.5 or 15 cm  | 7.5 or 15 cm  |
| Core diameter                              | ≥10.2 cm (4 inches)   | ≥10.2 cm (4 inches)   | ≥10.2 cm (4 inches)   |
| Method of sample processing, if any        | Following sectioning, same-depth samples were composited by replicate plot and homogenized with dry ice in a rotary-blase type mill to produce three samples per depth at each sampling interval. | Following sectioning, same-depth samples were composited by replicate plot and homogenized with dry ice in a rotary-blase type mill to produce three samples per depth at each sampling interval. | Following sectioning, same-depth samples were composited by replicate plot and homogenized with dry ice in a rotary-blase type mill to produce three samples per depth at each sampling interval. |
| Storage conditions                         | Frozen  | Frozen  | Frozen  |
| Storage length                             | Up to 518 days  | Up to 526 days  | Up to 553 days  |

Data were obtained from p. 16; Table 16, p. 43; Appendix D, p. 111 of the study report.

1 The study authors reported that the samples were taken from a grid block design; further details were not provided.

2 Samples were analyzed to a maximum depth of 30-45 cm at each test site (Appendix B, Tables B1-B3, pp. 54-74).

## 9. Analytical Procedures:

**Number of soil samples analysed per treatment or composite sample:** Three composite samples were analyzed at each sampling interval and depth for the bare treated plot at each test site (Appendix B, Tables B1-B3, pp. 54-74 and Appendix D, Tables VIII-X, pp. 132-152). Composite samples were generally analyzed once, however, selected samples were analyzed two or three times (Appendix D, p. 153; Appendix D, pp. 178-304, Appendix D, pp. 404-433).

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

Saflufenacil [BAS 800 H, CL No. 433379, 4054449, AC 433,379]

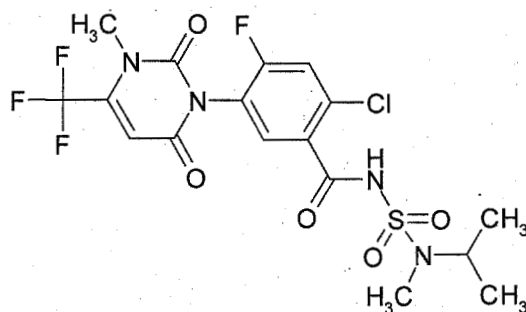
**IUPAC Name:** N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.  
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

**CAS Name:** 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

**CAS Number:** 372137-35-4.

**SMILES String:** N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).

**Empirical formula:** C<sub>17</sub>H<sub>17</sub>ClF<sub>4</sub>N<sub>4</sub>O<sub>5</sub>S **Molecular formula:** C<sub>17</sub>H<sub>17</sub>ClF<sub>4</sub>N<sub>4</sub>O<sub>5</sub>S

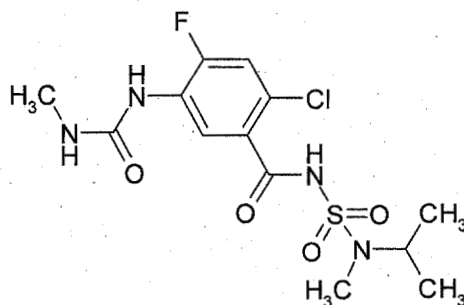


M800H07 [4775453]

**IUPAC Name:** N'-{4-Chloro-2-fluoro-5-[[[isopropyl(methyl)amino]sulfonyl]amino]carbonyl]phenyl}-N'-methylurea.

**CAS Name:** Not reported.

**CAS Number:** Not reported.





## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

**Extraction, clean up and concentration of soil samples:** Soil samples (0.1 g) were extracted by shaking twice with acetonitrile followed by acetonitrile:water (40:60, v:v; p. 17; Appendix D, p. 114; Figure 1, p. 117).

**Identification and quantification of parent compound:** Extracts were diluted and analyzed for saflufenacil using LC/MS/MS operated in the positive ion mode (Appendix D, p. 114). Quantitation was obtained using an external calibration curve created with the saflufenacil analytical standard (Lot No.: L67-140, purity 99.9%; Appendix D, p. 111).

**Identification and quantification of transformation products:** Extracts were diluted and analyzed for the following transformation products using LC/MS/MS in the positive ion mode (Appendix D, pp. 111-114):

### Reference Standards

| Applicant code | Reg. No. | Lot No. | Purity (%) | Chemical Name   |
|----------------|----------|---------|------------|---|
| M800H01        | 4118561  | L74-62  | 98.8       | N-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N'-isopropylsulfamide           |
| M800H02        | 4118416  | L67-186 | 99.2       | N'-[2-Chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydropyrimidin-1(2H)-yl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide           |
| M800H07        | 4775453  | L67-196 | 95.4       | N-{4-Chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino}carbonyl]phenyl}-N'-methylurea   |
| M800H08        | 4773881  | L74-66  | 97.2       | N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide    |
| M800H22        | 5216337  | L74-56  | 94.1       | 3-[(4-Chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino)carbonyl]anilino}carbonyl](methyl)amino]-4,4,4-trifluorobutanoic acid |
| M800H15        | 5264357  | L74-80  | 94.5       | N-{4-Chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino}carbonyl]phenyl}-4,4,4-trifluoro-3,3-dihydroxybutanamide               |

Chemical names were obtained from Ta, 2007 (MRID 47127825).

Quantitation was obtained using an external calibration curve created with the M800H01, M800H02, M800H07, M800H08, M800H22, and M800H15 analytical standards.

**Detection limits (LOD, LOQ) for the parent compound in soil:** The LOQ was 0.01 mg/kg and the LOD was 0.002 mg/kg (p. 17 and Appendix D, p. 114).

**Detection limits (LOD, LOQ) for the transformation products in soil:** The LOQ was 0.01 mg/kg and the LOD was 0.002 mg/kg for all analytes (p. 17 and Appendix D, p. 114).

## **Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

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### **Identified Compounds**

## **Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

### **II. RESULTS AND DISCUSSION**

**1. APPLICATION MONITORS:** Mean recovery of saflufenacil from the Speedisk™'s placed in the test plots were 86%, 92%, and 81% of the theoretical, based on the target application rate at Sites 1, 2, and 3, respectively (p. 20; Table 18, p. 45 and Appendix D, Table IV, pp. 124-125). Application verification spikes were prepared by fortifying nine Speedisk™'s with saflufenacil at a concentration similar to the application rate (p. 15 and Appendix D, p. 126). The nine spiked disks were then used to create three composite spike samples. Corrected recoveries from the application verification spike samples ranged from 81-92%, 72-108%, and 69-90% for the three replicate subplots at Sites 1, 2, and 3, respectively.

**2. RECOVERY FROM FIELD SPIKES:** The overall mean recovery of saflufenacil from field spikes fortified at 2.5 µg/g and stored frozen for up to 518 days (Site 1), 482 days (Site 2) or 509 days (Site 3) ranged from 67-101%, 78-102%, and 68-106% for Sites 1, 2, and 3, respectively (p. 20; Table 19, p. 46 and Appendix D, Tables V-VII, pp. 128-130); recoveries were corrected for procedural recoveries. Recoveries were similar across all fortification dates.

**3. MASS ACCOUNTING:** A complete mass balance could not be determined because carbon dioxide and non-extractable residues were not measured.

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

Saflufenacil [BAS 800 H, CL No. 433379, 4054449, AC 433,379]

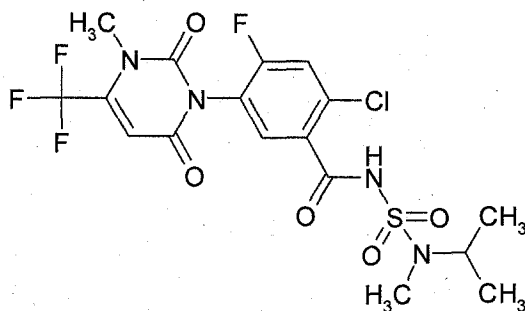
**IUPAC Name:** N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.  
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

**CAS Name:** 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

**CAS Number:** 372137-35-4.

**SMILES String:** N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(CI)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).

**Empirical formula:** C<sub>17</sub>H<sub>17</sub>ClF<sub>4</sub>N<sub>4</sub>O<sub>5</sub>S      **Molecular formula:** C<sub>17</sub>H<sub>17</sub>ClF<sub>4</sub>N<sub>4</sub>O<sub>5</sub>S



# Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

Table 6a. Concentration of saflufenacil residues expressed as ppm in soil from Site 1 (Arkansas).

| Compound     | Soil depth (cm) | Sampling times (days) |       |       |                   |                   |                   |                   |                   |       |       |       |                   |       |       |       |       |                   |       |       |
|--------------|-----------------|-----------------------|-------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------|-------|-------|-------------------|-------|-------|-------|-------|-------------------|-------|-------|
|              |                 | 0                     | 1     | 2     | 4                 | 6                 | 8                 | 10                | 15                | 20    | 30    | 45    | 60                | 75    | 90    | 120   | 150   | 180               | 270   | 360   |
| Saflufenacil | 0-7.5           | 0.16                  | 0.11  | 0.10  | 0.09              | 0.07              | 0.04              | 0.06              | 0.05              | 0.05  | 0.03  | 0.02  | 0.01 <sup>2</sup> | <0.01 | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 |
|              | 7.5-15          | <0.01                 | <0.01 | 0.02  | <0.01             | 0.01 <sup>1</sup> | 0.01 <sup>1</sup> | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 |
|              | 15-30           | <0.01                 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 |
|              | 30-45           | <0.01                 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 |
| M800H08      | 0-7.5           | <0.01                 | <0.01 | <0.01 | 0.01 <sup>1</sup> | 0.01 <sup>2</sup> | <0.01             | 0.01 <sup>1</sup> | 0.02 <sup>1</sup> | 0.01  | 0.02  | 0.02  | 0.02              | 0.02  | 0.02  | <0.01 | 0.01  | 0.01 <sup>1</sup> | <0.01 | <0.01 |
|              | 7.5-15          | <0.01                 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 |
|              | 15-30           | <0.01                 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 |
|              | 30-45           | <0.01                 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 | <0.01             | <0.01 | <0.01 |

Data were obtained from Appendix B, Table B1, pp. 54-60 and Appendix D, Table VIII, pp. 132-138 of the study report. Concentrations are registrant-calculated means of three replicate values unless otherwise reported. Total extractable and nonextractable residues were not determined. All samples with residue concentration below the LOQ (0.01 ppm) were reported as <0.01 ppm. As a result, the reviewer was unable to determine which, if any, samples had detections between the LOD (0.002 ppm) and the LOQ. Saflufenacil and its transformation products were not detected above the LOQ in soil samples collected prior to the test application and analyzed to a depth of 120 cm. The transformation products M800H01, M800H02, M800H07, M800H15, and M800H22 were not detected above the LOQ at any sampling interval or depth.

1 Single replicate detection.

2 Reviewer-calculated mean of two replicate detections.

## **Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874

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PMRA Submission Number 2008-0430

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### **Attachment 1: Structures of Parent Compound and Transformation Products**

# **Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

Table 6b. Concentration of saflufenacil residues expressed as ppm in soil from Site 2 (Illinois).

| Compound     | Soil depth (cm) | Sampling times (days) |                   |                   |                   |                   |                   |                   |       |       |       |                   |                   |                   |                   |                   |       |       |       |       |
|--------------|-----------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------|-------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------|-------|-------|-------|
|              |                 | 0                     | 1                 | 2                 | 4                 | 6                 | 8                 | 10                | 15    | 20    | 30    | 45                | 60                | 75                | 90                | 120               | 150   | 180   | 270   | 360   |
| Saflufenacil | 0-7.5           | 0.14                  | 0.13              | 0.10              | 0.08              | 0.10              | 0.10              | 0.07              | 0.06  | 0.03  | 0.02  | 0.01 <sup>1</sup> | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 |
|              | 7.5-15          | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 |
|              | 15-30           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 |
|              | 30-45           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 |
| M800H08      | 0-7.5           | <0.01                 | 0.01 <sup>1</sup> | 0.01 <sup>1</sup> | 0.02 <sup>2</sup> | 0.02 <sup>2</sup> | 0.01 <sup>1</sup> | 0.02 <sup>2</sup> | 0.02  | 0.02  | 0.03  | 0.02              | 0.02 <sup>2</sup> | 0.01 <sup>1</sup> | 0.02 <sup>1</sup> | 0.01 <sup>1</sup> | <0.01 | <0.01 | <0.01 | <0.01 |
|              | 7.5-15          | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | 0.01 <sup>1</sup> | 0.01 <sup>2</sup> | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 |
|              | 15-30           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 |
|              | 30-45           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 | <0.01 | <0.01 |

Data were obtained from Appendix B, Table B2, pp. 61-67 and Appendix D, Table IX, pp. 139-145 of the study report. Concentrations are registrant-calculated means of three replicate values unless otherwise reported. Total extractable and nonextractable residues were not determined. All samples with residue concentration below the LOQ (0.01 ppm) were reported as <0.01 ppm. As a result, the reviewer was unable to determine which, if any, samples had detections between the LOD (0.002 ppm) and the LOQ. Saflufenacil and its transformation products were not detected above the LOQ in soil samples collected prior to the test application and analyzed to a depth of 120 cm. The transformation products M800H01, M800H02, M800H07, M800H15, and M800H22 were not detected above the LOQ at any sampling interval or depth.

1 Single replicate detection.

2 Reviewer-calculated mean of two replicate detections.

## **Data Evaluation Record on the terrestrial field dissipation of saflufenacil**

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

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and submitted by BASF Corporation, Research Triangle Park, North Carolina. Study Protocol ID.: 132650.

3. Ta, C. 2007. BAS 800 H: Soil photolysis. Unpublished study performed, submitted, and sponsored by BASF Corporation, Research Triangle Park, North Carolina. BASF Doc ID: 2007/7007647. Study Protocol ID: 132653.
4. U.S. Environmental Protection Agency. 1982. Pesticide Assessment Guidelines, Subdivision N, Chemistry: Environmental Fate, Section 164-1, Terrestrial Field Dissipation Studies. Office of Pesticide and Toxic Substances, Washington, DC. EPA 540/9-82-021.
5. U.S. Environmental Protection Agency. 1993. Pesticide Registration Rejection Rate Analysis - Environmental Fate. Office of the Prevention, Pesticides, and Toxic Substances, Washington, DC. EPA 738-R-93-010.
6. U.S. Environmental Protection Agency. 1989. FIFRA Accelerated Reregistration, Phase 3 Technical Guidance. Office of the Prevention, Pesticides, and Toxic Substances, Washington, DC. EPA 540/09-90-078.



# Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

PMRA Submission Number 2008-0430

EPA MRID Number 47128235

Table 6c. Concentration of saflufenacil residues expressed as ppm in soil from Site 3 (Manitoba).

| Compound     | Soil depth (cm) | Sampling times (days) |                   |                   |                   |                   |       |                   |                   |       |                   |                   |                   |                   |       |       |
|--------------|-----------------|-----------------------|-------------------|-------------------|-------------------|-------------------|-------|-------------------|-------------------|-------|-------------------|-------------------|-------------------|-------------------|-------|-------|
|              |                 | 0                     | 1                 | 4                 | 6                 | 8                 | 10    | 15                | 20                | 30    | 45                | 60                | 75                | 90                | 120   | 150   |
| Saflufenacil | 0-7.5           | 0.09                  | 0.14              | 0.08              | 0.12              | 0.12 <sup>2</sup> | 0.09  | 0.09              | 0.08              | 0.07  | 0.11              | 0.03              | 0.02 <sup>2</sup> | 0.01 <sup>2</sup> | <0.01 | <0.01 |
|              | 7.5-15          | <0.01                 | 0.01 <sup>2</sup> | 0.03              | 0.02              | 0.02              | 0.02  | 0.01 <sup>2</sup> | 0.01 <sup>1</sup> | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |
|              | 15-30           | <0.01                 | <0.01             | <0.01             | 0.02 <sup>1</sup> | <0.01             | <0.01 | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |
|              | 30-45           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |
| M800H07      | 0-7.5           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01 | 0.01 <sup>2</sup> | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |
|              | 7.5-15          | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |
|              | 15-30           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |
|              | 30-45           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |
| M800H08      | 0-7.5           | 0.01                  | <0.01             | 0.02 <sup>2</sup> | 0.02              | <0.01             | 0.01  | 0.01              | 0.02 <sup>2</sup> | <0.01 | 0.02              | 0.01 <sup>1</sup> | <0.01             | <0.01             | <0.01 | <0.01 |
|              | 7.5-15          | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |
|              | 15-30           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |
|              | 30-45           | <0.01                 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01 | <0.01             | <0.01             | <0.01             | <0.01             | <0.01 | <0.01 |

Data were obtained from Appendix B, Table B3, pp. 68-74 and Appendix D, Table X, pp. 146-152 of the study report. Concentrations are registrant-calculated means of three replicate values unless otherwise reported. Total extractable and nonextractable residues were not determined. All samples with residue concentration below the LOQ (0.01 ppm) were reported as <0.01 ppm. As a result, the reviewer was unable to determine which, if any, samples had detections between the LOD (0.002 ppm) and the LOQ. Saflufenacil and its transformation products were not detected above the LOQ in soil samples collected prior to the test application and analyzed to a depth of 120 cm. The transformation products M800H01, M800H02, M800H15, and M800H22 were not detected above the LOQ at any sampling interval or depth.

1 Single replicate detection.

2 Reviewer-calculated mean of two replicate detections.

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

the theoretical day 0 concentration of saflufenacil in the 0-7.5 cm soil depth based on one application at the target application rate.

5. The study authors stated that, based on a review of the laboratory studies, saflufenacil would be expected to degrade predominantly through aerobic soil processes in the field to the transformation product M800H08 and other metabolites (pp. 18-19). In a laboratory aerobic soil metabolism study, saflufenacil degraded with a non-linear half-life of 9.3-32 days;  $^{14}\text{CO}_2$  accounted for up to 15% following 334 days and an additional 15-35% of the radioactivity was associated with non-extractable residues (Singh, 2007; MRID 47127826).
6. Concurrent recoveries were determined by fortifying control soil samples with saflufenacil and the transformation products M800H01, M800H02, M800H07, M800H08, M800H15, and M800H22 at 0.01 and 0.1 ppm (p. 20 and Appendix D, p. 116). At Site 1 (Arkansas), mean recoveries ( $\pm$  standard deviation) were  $98 \pm 10\%$  for saflufenacil,  $97 \pm 9\%$  for M800H01,  $99 \pm 9\%$  for M800H02,  $97 \pm 13\%$  for M800H07,  $100 \pm 16\%$  for M800H08,  $92 \pm 12\%$  for M800H15, and  $94 \pm 8\%$  for M800H22; recoveries were similar across all fortification levels (Table 17, p. 44; Appendix D, p. 116; Table I, p. 121). At Site 2 (Illinois), mean recoveries ( $\pm$  standard deviation) were  $96 \pm 12\%$  for saflufenacil,  $95 \pm 12\%$  for M800H01,  $94 \pm 11\%$  for M800H02,  $95 \pm 9\%$  for M800H07,  $95 \pm 14\%$  for M800H08,  $92 \pm 15\%$  for M800H15, and  $90 \pm 12\%$  for M800H22; recoveries were similar across all fortification levels (Appendix D, Table II, p. 122). At Site 3 (Manitoba), mean recoveries ( $\pm$  standard deviation) were  $94 \pm 9\%$  for saflufenacil,  $97 \pm 7\%$  for M800H01,  $96 \pm 8\%$  for M800H02,  $88 \pm 7\%$  for M800H07,  $92 \pm 10\%$  for M800H08,  $90 \pm 12\%$  for M800H15, and  $96 \pm 8\%$  for M800H22; recoveries were similar across all fortification levels (Appendix D, Table III, p. 123).
7. Residues of M800H08 in soil samples were corrected to account for the contribution of the chlorine isotope  $^{37}\text{Cl}$  from saflufenacil (Appendix D, p. 115). The correction was applied only for the quantitation of the treated samples and only to the samples that contained residues at or above the LOD. The correction was not applied to the procedural fortification samples.
8. The study was terminated after 12 months, rather than the Subdivision N guideline-specified duration for field and vegetable crops of 18 months, because residues were not quantified in the two preceding intervals (p. 75).

## V. REFERENCES

1. Gooding, R. and M. Saha. 2008. Freezer storage stability of BAS 800 H and the relevant metabolites in soil samples. Unpublished study performed by BASF Agro Research, Research Triangle Park, North Carolina; sponsored and submitted by BASF Corporation, Research Triangle Park, North Carolina. BASF Study No.: 132671. BASF Registration Document No.: 2007/7013581.
2. Singh, M. 2007. Aerobic soil metabolism of  $^{14}\text{C}$ -BAS 800 H on US soils. Unpublished study performed by BASF Agro Research, Research, Triangle Park, North Carolina and sponsored

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

**4. PARENT COMPOUND:** Following application at Site 1 (Arkansas), the mean measured zero-time concentration of saflufenacil in the 0-7.5 cm soil depth was 0.16 ppm or 100.7% of the theoretical (the percent recovery was reviewer-calculated based on a theoretical day 0 recovery of 0.159 ppm for the 0-7.5 cm soil depth; Appendix B, Table B1, p. 54 and Appendix D, Table VIII, p. 132); the registrant-calculated day 0 recovery was 101% (p. 21). Saflufenacil decreased to 0.11 ppm at 1 day, 0.07 to 0.09 ppm at 4 to 6 days, 0.05 to 0.06 ppm at 10 to 20 days, 0.03 ppm at 30 days, 0.02 ppm at 45 days, and was last detected above the LOQ at 0.01 ppm (two replicate detections) at 60 days posttreatment. Saflufenacil was initially detected in the 7.5-15 cm soil depth at a maximum mean of 0.02 ppm at 2 days posttreatment, and decreased to 0.01 ppm (single replicate detections) at 6 and 8 days posttreatment. Saflufenacil was not detected above the LOQ in soil below the 7.5-15 cm depth.

Following application at Site 2 (Illinois), the mean measured zero-time concentration of saflufenacil in the 0-7.5 cm soil depth was 0.14 ppm or 107.0% of the theoretical (the percent recovery was reviewer-calculated based on a theoretical day 0 recovery of 0.131 ppm for the 0-7.5 cm soil depth; Appendix B, Table B2, p. 61 and Appendix D, Table IX, p. 139); the registrant-calculated day 0 recovery was 112% (p. 21). Saflufenacil decreased to 0.07 ppm at 10 days, 0.03 ppm at 20 days, 0.02 ppm at 30 days, and was last detected above the LOQ at 0.01 ppm (single replicate detection) at 45 days posttreatment. Saflufenacil was not detected above the LOQ in soil below the 0-7.5 cm depth.

Following application at Site 3 (Manitoba), the mean measured zero-time concentration of saflufenacil in the 0-7.5 cm soil depth was 0.09 ppm or 48.1% of the theoretical (the percent recovery was reviewer-calculated based on a theoretical day 0 recovery of 0.187 ppm for the 0-7.5 cm soil depth; Appendix B, Table B3, p. 68 and Appendix D, Table X, p. 146), and was a maximum of 0.14 ppm (74.8% of the theoretical) at 1 day posttreatment; the registrant-calculated day 0 recovery was 82% (p. 20). Saflufenacil decreased to 0.07 ppm at 30 days, increased to 0.11 ppm at 45 days, then decreased to 0.03 ppm at 60 days, 0.02 ppm (two replicate detections) at 75 days, and was last detected above the LOQ at 0.01 ppm (two replicate detections) at 90 days posttreatment. Saflufenacil was initially detected in the 7.5-15 cm soil depth at 0.01 ppm (two replicate detections) at 1 day posttreatment, increased to a maximum mean of 0.03 ppm at 4 days, and ranged from 0.01 to 0.02 ppm from 6 to 20 days posttreatment. Saflufenacil was detected once in the 15-30 cm soil depth at 0.02 ppm (single replicate detection) at 6 days posttreatment, and was not detected above the LOQ in soil below the 15-30 cm depth.

**HALF-LIFE:** Under field conditions at Site 1 (Arkansas), saflufenacil dissipated from the top 7.5 cm of soil with a half-life of 17.1 days ( $r^2 = 0.850$ ); calculated by the reviewer using linear regression on replicate data following the maximum mean detection (*i.e.*, 0- to 60-day data) and assuming that concentrations less than the LOQ were one-half the LOQ (*i.e.*, 0.005 ppm). Respective DT75 and DT90 values were 34.2 days and 56.8 days. Registrant-calculated DT50, DT75, and DT90 values were 6.25 days, 24.4 days, and 50.4 days, respectively, using a double first order in parallel (DFOP) kinetic model to describe the dissipation and based on the total mass of saflufenacil in the soil profile ( $r^2$  for the model was 0.902; pp. 23-24; Appendix E, pp. 448-450; Table 9, p. 461; Figure 6, p. 468). The registrant-calculated values were confirmed by the PMRA reviewer.

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

### III. STUDY DEFICIENCIES

1. Run off of the test compound was not studied at the test sites. The study author argues that infiltration would have been more likely than run off at the Arkansas site due to a slope of 0.1% and little initial precipitation. However, the author continues that infiltration excess and saturation excess runoff can occur on silt loam soils such as found at the Arkansas test site (pp. 495-496). The hydrology evaluation concluded that infiltration was more likely than runoff considering the site was flat (0.1% slope) and the first precipitation events were approx 1.5 inches per day or less. Therefore, this deficiency does not impact the acceptability of the study.
2. M800H31 was a relatively long-lived, major degradate in the submitted aerobic soil metabolism study. Therefore, M800H31 should have been included in this field study's analysis. This deficiency does not impact the acceptability of the study.

### IV. REVIEWER'S COMMENTS

1. The stability of the transformation products of saflufenacil in the test site soils was demonstrated under typical laboratory storage conditions. Test samples and field spikes in the field dissipation study were stored frozen for up to 16-18 months prior to analysis. A separate laboratory freezer storage stability study was conducted using soil collected from the test sites, fortified with the parent and its transformation products, and stored frozen for a maximum of 18.5 months (*i.e.*, 560 days) (Gooding and Saha, 2008; MRID 47560309). Results indicate that saflufenacil and its transformation products were stable in all three test soils, with the exception of M800H15.
2. USEPA: One of the field sites was located in Canada. The study authors did not make any effort to establish comparability between this test site soil and U.S. soils.
3. The study authors reported all residues of saflufenacil and the transformation products M800H01, M800H02, M800H07, M800H08, M800H15, and M800H22 in terms of the LOQ (0.01 ppm), rather than differentiating residues in terms of being below the LOQ but above the LOD (0.002 ppm), or below the LOD (Appendix B, Tables B1-B3, pp. 54-74; Appendix D, Tables VIII-X, pp. 132-152). Residues below the LOQ should be reported as "<LOQ" ("<0.01 ppm"), and residues below the LOD should be reported as "not detected" or "<LOD" ("<0.002 ppm") to allow the reviewer to determine which samples contained residues of the parent and transformation products that were not quantifiable and which samples did not contain residues.
4. The maximum concentration of M800H07 and M800H08 in soil was converted to parent equivalents by the reviewer by dividing the concentration of the transformation product by the molecular weight conversion factor (0.76 for M800H07 and 1.00 for M800H08). The molecular weight conversion factor was calculated by dividing the molecular weight of M800H07 (380.8 g/mol) and M800H08 (502.9 g/mol) by the molecular weight of the parent (500.9 g/mol). The percent of M800H07 and M800H08 in terms of percent of the applied saflufenacil was calculated by dividing the concentration of the transformation products in parent equivalents by

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874

EPA MRID Number 47128235

PMRA Submission Number 2008-0430

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Under field conditions at Site 2 (Illinois), saflufenacil dissipated from the top 7.5 cm of soil with a half-life of 10.4 days ( $r^2 = 0.917$ ), calculated by the reviewer using linear regression on replicate data following the maximum mean detection (*i.e.*, 0- to 45-day data) and assuming that concentrations less than the LOQ were one-half the LOQ (*i.e.*, 0.005 ppm). Respective DT75 and DT90 values in soil were 20.9 days and 34.6 days. Registrant-calculated DT50, DT75, and DT90 values were 11.1 days, 22.1 days, and 36.7 days, respectively, using a non-linear single first order (SFO) kinetic model to describe the dissipation and based on the total mass of saflufenacil in the soil profile ( $r^2$  for the model was 0.923; pp. 23-24; Appendix E, pp. 448-451; Table 9, p. 461; Figure 9, p. 471). The registrant-calculated values were confirmed by the PMRA reviewer.

Under field conditions at Site 3 (Manitoba), saflufenacil dissipated from the top 7.5 cm of soil with a half-life of 24.6 days ( $r^2 = 0.563$ ); calculated by the reviewer using linear regression on replicate data following the maximum mean detection (*i.e.*, 1- to 90-day data) and assuming that concentrations less than the LOQ were one-half the LOQ (*i.e.*, 0.005 ppm). Respective DT75 and DT90 values were 49.2 days and 81.6 days. Registrant-calculated DT50, DT75, and DT90 values were 35.5 days, 71.1 days, and 118 days, respectively, using a non-linear single first order (SFO) kinetic model to describe the dissipation and based on the total mass of saflufenacil in the soil profile ( $r^2$  for the model was 0.672; pp. 23-24; Appendix E, pp. 448-451; Table 9, p. 461; Figure 13, p. 475). The registrant-calculated values were confirmed by the PMRA reviewer.

**5. TRANSFORMATION PRODUCTS:** At Site 1 (Arkansas), the only transformation product detected was **M800H08** (N'-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-n-methylsulfamide), which was detected in the soil at a maximum mean concentration of 0.02 ppm at 15 days and 30 to 90 days. Converting the concentration of M800H08 into parent equivalents, this is 12.5% of the applied saflufenacil, based on the target application rate, and 12.5% of the initial soil concentration of saflufenacil. At 150 to 180 days posttreatment, M800H08 decreased to 0.01 ppm (Appendix B, Table B1, p. 58 and Appendix D, Table VIII, p. 136). M800H08 was not detected above the LOQ in soil below the 0-7.5 cm depth. The registrant-calculated DT50, DT75, and DT90 values for M800H08 were 149 days, 298 days, and 494 days, respectively, using a non-linear single first order (SFO) kinetic model to describe the dissipation ( $r^2$  for the model was 0.385; p. 24; Appendix E, pp. 448-451; Table 10, p. 462; Figure 8, p. 470).

At Site 2 (Illinois), the only transformation product detected was **M800H08** (N'-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-n-methylsulfamide), which was detected in the soil at a maximum mean concentration of 0.03 ppm at 30 days. Converting the concentration of M800H08 into parent equivalents, this is 22.8% of the applied saflufenacil, based on the target application rate, and 21.3% of the initial soil concentration of saflufenacil. M800H08 decreased to 0.02 ppm at 45 to 60 days and 90 days, and was last detected above the LOQ at 0.01 ppm (single replicate detection) at 120 days posttreatment (Appendix B, Table B2, p. 65 and Appendix D, Table IX, p. 153). M800H08 was detected twice in the 7.5-15 cm soil depth at 0.01 ppm (single replicate detections) at 45 to 60 days. M800H08 was not detected above the LOQ in soil below the 7.5-15 cm depth. The registrant-calculated DT50, DT75, and DT90 values for M800H08 were 33.6 days, 67.3 days, and 112 days, respectively, using

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

**10. RUN OFF:** Run off was not studied at any of the test sites.

**11. RESIDUE CARRYOVER:** At Site 1 (Arkansas), the DT90 was 131 days. Saflufenacil and its transformation products were not available for carryover at the end of the study period (Appendix B, Table B1, pp. 54-60); residues were not detected above the LOQ following 180 days after application.

At Site 2 (Illinois), the DT90 was 34.6 days. Saflufenacil and its transformation products were not available for carryover at the end of the study period (Appendix B, Table B2, pp. 61-67); residues were not detected above the LOQ following 120 days after application.

At Site 3 (Manitoba), the DT90 was 185 days. Saflufenacil and its transformation products were not available for carryover at the end of the study period (Appendix B, Table B3, pp. 68-74); residues were not detected above the LOQ following 90 days after application.

**12. SUPPLEMENTARY STUDY RESULTS:** Storage stability results from Gooding and Saha, 2008 (MRID 47128237) indicate that saflufenacil and its transformation products were stable in soil collected from all three test sites and stored frozen for up to 9 months, with the exception of M800H15 (Gooding and Saha, 2008, pp. 16-17).

At Site 1 (Arkansas), recovery of saflufenacil ranged from 74 to 119%, recovery of M800H01 ranged from 79 to 108%, recovery of M800H02 ranged from 83 to 109%, recovery of M800H07 ranged from 89 to 118%, recovery of M800H08 ranged from 64 to 141%, and recovery of M800H22 ranged from 110 to 141% following 0 to 9 months of freezer storage, with no pattern of decline for any of the analytes (0-7.5 cm and 30-45 cm soil depths; Gooding and Saha, 2008, p. 16; Table IX, p. 165). Recovery of M800H15 was 102 to 106% at day 0 and decreased to 18 to 76% following 6 to 9 months of storage (0-7.5 cm and 30-45 cm soil depths).

At Site 2 (Illinois), recovery of saflufenacil ranged from 85 to 117%, recovery of M800H01 ranged from 70 to 120%, recovery of M800H02 ranged from 86 to 125%, recovery of M800H07 ranged from 91 to 131%, recovery of M800H08 ranged from 61 to 163%, and recovery of M800H22 ranged from 94 to 124% following 0 to 9 months of freezer storage, with no pattern of decline for any of the analytes (0-2.5 cm and 30-45 cm soil depths; Gooding and Saha, 2008, pp. 16-17; Table IX, p. 168). Recovery of M800H15 was 96 to 106% at day 0 and decreased to 14 to 59% following 6 to 9 months of storage (0-2.5 cm and 30-45 cm soil depths).

At Site 3 (Manitoba), recovery of saflufenacil ranged from 83 to 114%, recovery of M800H01 ranged from 93 to 142%, recovery of M800H02 ranged from 84 to 112%, recovery of M800H07 ranged from 89 to 137%, recovery of M800H08 ranged from 77 to 125%, and recovery of M800H22 ranged from 93 to 136% following 0 to 9 months of freezer storage with no pattern of decline for any of the analytes (0-7.5 cm and 30-45 cm soil depths; Gooding and Saha, 2008, p. 17; Table IX, p. 169). Recovery of M800H15 was 86 to 127% at day 0 and decreased to 28 to 84% following 6 to 9 months of storage (0-7.5 cm and 30-45 cm soil depths).

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

a non-linear single first order (SFO) kinetic model to describe the dissipation ( $r^2$  for the model was 0.568; p. 24; Appendix E, pp. 448-451; Table 10, p. 462; Figure 12, p. 474).

At Site 3 (Manitoba), the transformation product **M800H08** (N'-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-n-methylsulfamide) was detected in the soil at a maximum mean concentration of 0.02 ppm at 4 to 6 days, 20 days, and 45 days. Converting the concentration of M800H08 into parent equivalents, this is 10.6% of the applied saflufenacil, based on the target application rate, and 22.1% of the initial soil concentration of saflufenacil. At 60 days posttreatment, M800H08 decreased to 0.01 ppm (single replicate detection; Appendix B, Table B3, p. 72 and Appendix D, Table X, p. 150). M800H08 was not detected above the LOQ in soil below the 0-7.5 cm depth.

The transformation product **M800H07** (N-{4-chloro-2-fluoro-5-[[([isopropyl(methyl)amino)sulfonyl]amino)carbonyl]phenyl}-N'-methylurea) was detected once in the 0-7.5 cm soil depth at a concentration of 0.01 ppm at 45 days posttreatment (two replicate detections; Appendix B, Table B3, p. 71 and Appendix D, Table X, p. 149). Converting the concentration of M800H07 into parent equivalents, this is 7.0% of the applied saflufenacil, based on the target application rate, and 14.6% of the initial soil concentration of saflufenacil. M800H07 was not detected above the LOQ in soil below the 0-7.5 cm depth.

Table 7: Chemical names and CAS numbers for the transformation products of saflufenacil.

| Applicants Code Name | CAS Number | Chemical Name  | Chemical Formula           | Molecular Weight (g/mol) | Smiles String |
|----------------------|------------|--|----------------------------|--------------------------|---------------|
| M800H07              |            | N-{4-Chloro-2-fluoro-5-[[([isopropyl(methyl)amino)sulfonyl]amino)carbonyl]phenyl}-N'-methylurea                                    | $C_{13}H_{18}ClF_4N_4O_4S$ | 380.8                    |               |
| M800H08              |            | N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-n-methylsulfamide | $C_{17}H_{19}ClF_4N_4O_5S$ | 502.9                    |               |

Data were obtained from Appendix D, pp. 112-113 of the study report.  
Chemical names were obtained from Ta, 2007 (MRID 47127825).

**6. EXTRACTABLE AND NON-EXTRACTABLE RESIDUES:** Non-extractable residues were not measured.

## Data Evaluation Record on the terrestrial field dissipation of saflufenacil

PMRA Document Number 1546874  
PMRA Submission Number 2008-0430

EPA MRID Number 47128235

Table 8: Dissipation routes of saflufenacil under field conditions.

| Route of dissipation                          | Site 1 (Arkansas)                                    | Site 2 (Illinois) | Site 3 (Manitoba) |
|---|--|-------------------|-------------------|
|   | % of applied amount (at the end of the study period) |                   |                   |
| Accumulation (residues) in soil/ carry over   | 0%   | 0%                | 0%                |
| Transformation (% of transformation products) | 0%   | 0%                | 0%                |
| Leaching, if measured                         | Not determined                                       | Not determined    | Not determined    |
| Volatilization, if measured                   | Not measured   | Not measured      | Not measured      |
| Plant uptake, if measured                     | Not applicable                                       | Not applicable    | Not applicable    |
| Run off, if measured                          | Not measured   | Not measured      | Not measured      |
| Total   |  |                   |                   |

Saflufenacil and its transformation products were not detected at the end of the study period.

**7. VOLATILIZATION:** The concentration of applied saflufenacil lost through volatilization was not determined at the test sites.

**8. PLANT UPTAKE:** Not applicable.

**9. LEACHING:** In the bare soil plot at Site 1 (Arkansas), residues of saflufenacil were not detected above the LOQ in soil below the 7.5-15 cm depth, and the transformation product M800H08 was not detected above the LOQ in soil below the 0-7.5 cm depth (Appendix B, Table B1, pp. 54, 58 and Appendix D, Table VIII, pp. 132, 136). The study authors did not distinguish concentrations detected above the LOD and below the LOQ from non-detects.

In the bare soil plot at Site 2 (Illinois), residues of saflufenacil were not detected above the LOQ in soil below the 0-7.5 cm depth, and the transformation product M800H08 was not detected above the LOQ in soil below the 7.5-15 cm depth (Appendix B, Table B2, pp. 61, 65 and Appendix D, Table IX, pp. 139, 143). The study authors did not distinguish concentrations detected above the LOD and below the LOQ from non-detects.

In the bare soil plot at Site 3 (Manitoba), residues of saflufenacil were not detected above the LOQ in soil below the 15-30 cm depth, and the transformation products M800H07 and M800H08 were not detected above the LOQ in soil below the 0-7.5 cm depth (Appendix B, Table B3, pp. 68, 71-72 and Appendix D, Table X, pp. 146, 149-150). The study authors did not distinguish concentrations detected above the LOD and below the LOQ from non-detects.

The potential for leaching was determined from a net water balance assessment (based on precipitation, irrigation, and evapotranspiration; p. 23; Appendix F, pp. 494-497). At Site 1 (Arkansas), conditions were generally not conducive for leaching for *ca.* 5 months after application (Appendix F, Figure 1, p. 501). Site conditions later became conducive to leaching for a period of 4 months. At Site 2 (Illinois), conditions were generally not conducive for leaching for *ca.* 6 weeks after application (Appendix F, Figure 2, p. 502). Site conditions later became conducive to leaching for a period of 6 months. At Site 3 (Manitoba), conditions were not conducive for leaching throughout the entire study period (Appendix F, Figure 3, p. 503).